TABLE 15: CAPSULE LOCI

ORF Number	DNA SEQ ID Number	Protein SEQ ID Number	Locus
1701a	Seq. ID No.3535	Seq. ID No.3536	Teichuronic
1701b	Seq. ID No. 3537	Seq. ID No. 3538	Teichuronic
1703b	Seq. ID No.3539	Seq. ID No.3540	Teichuronic
1704a	Seq. ID No.3541	Seq. ID No.3542	Teichuronic
1704b	Seq. ID No. 3543	Seq. ID No. 3544	Teichuronic
1705a	Seq. ID No.3545	Seq. ID No.3546	Teichuronic
1705b	Seq. ID No.3547	Seq. ID No.3548	Teichuronic
1706	Seq. ID No. 3549	Seq. ID No. 3550	Teichuronic
1707a	Seq. ID No.3551	Seq. ID No.3552	Teichuronic
1707b	Seq. ID No. 3553	Seq. ID No. 3554	Teichuronic
1708	Seq. ID No.3555	Seq. ID No.3556	Teichuronic
1709	Seq. ID No.3557	Seq. ID No.3558	Teichuronic
1710a	Seq. ID No.3559	Seq. ID No.3560	Teichuronic
1710b	Seq. ID No. 3561	Seq. ID No. 3562	Teichuronic

Listed in Table 16 are 14 ORFs determined by keyword search of the BlastP results to be associated with sporulation.

TABLE 16: SPORULATION RELATED PROTEINS

ORF Number	DNA SEQ ID Number	Protein SEQ ID Number
524b	Seq. ID No. 1137	Seq. ID No. 1138
683b	Seq. ID No. 1455	Seq. ID No. 1456
1058	Seq. ID No. 2137	Seq. ID No. 2138
1060b	Seq. ID No. 2141	Seq. ID No. 2142
1070b	Seq. ID No. 2165	Seq. ID No. 2166
1077e	Seq. ID No. 2179	Seq. ID No. 2180
1149	Seq. ID No. 2301	Seq. ID No. 2302
1348	Seq. ID No. 2753	Seq. ID No. 2754
2011c	Seq. ID No. 4211	Seq. ID No. 4212
2024d	Seq. ID No. 4251	Seq. ID No. 4252
2065a	Seq. ID No. 4327	Seq. ID No. 4328
2181a	Seq. ID No. 4569	Seq. ID No. 4570
2256	Seq. ID No. 4719	Seq. ID No. 4720
2260c	Seq. ID No. 4729	Seq. ID No. 4730

Listed in Table 17 are the 913 start to stop ORFs which are unique to *Alloiococcus otitidis*, or 653 unique Stop-Stop ORFs identified as having a BlastP 'E Value' of > e^{-10} (not identified separately in Table 17).

TABLE 17: UNIQUE ORFS

ORF Number	DNA SEQ ID Number	Protein SEQ ID Number
4a	Seq. ID No. 7	Seq. ID No. 8
11	Seq. ID No. 19	Seq. ID No. 20
13a	Seq. ID No. 21	Seq. ID No. 22
16	Seq. ID No. 23	Seq. ID No. 24
21b	Seq. ID No. 31	Seq. ID No. 32
32	Seq. ID No. 39	Seq. ID No. 40
44a	Seq. ID No. 65	Seq. ID No. 66
44b	Seq. ID No. 67	Seq. ID No. 68
45	Seq. ID No. 69	Seq. ID No. 70
55	Seq. ID No. 91	Seq. ID No. 92
58	Seq. ID No. 99	Seq. ID No. 100
61	Seq. ID No. 105	Seq. ID No. 106
63a	Seq. ID No. 113	Seq. ID No. 114
63b	Seq. ID No. 115	Seq. ID No. 116
66a	Seq. ID No. 123	Seq. ID No. 124
67	Seq. ID No. 125	Seq. ID No. 126
69	Seq. ID No. 127	Seq. ID No. 128
73a	Seq. ID No. 131	Seq. ID No. 132
73b	Seq. ID No. 133	Seq. ID No. 134
79	Seq. ID No. 139	Seq. ID No. 140
83	Seq. ID No. 151	Seq. ID No. 152
86	Seq. ID No. 159	Seq. ID No. 160
87a	Seq. ID No. 161	Seq. ID No. 162
87b	Seq. ID No. 163	Seq. ID No. 164
87c	Seq. ID No. 165	Seq. ID No. 166

TABLE 17: UNIQUE ORFs

ORF Number	DNA SEQ ID Number	Protein SEQ ID Number
89	Seq. ID No. 169	Seq. ID No. 170
94	Seq. ID No. 185	Seq. ID No. 186
97b	Seq. ID No. 189	Seq. ID No. 190
101	Seq. ID No. 193	Seq. ID No. 194
119a	Seq. ID No. 229	Seq. ID No. 230
119b	Seq. ID No. 231	Seq. ID No. 232
132a	Seq. ID No. 255	Seq. ID No. 256
132b	Seq. ID No. 257	Seq. ID No. 258
132c	Seq. ID No. 259	Seq. ID No. 260
142	Seq. ID No. 275	Seq. ID No. 276
163	Seq. ID No. 337	Seq. ID No. 338
164	Seq. ID No. 339	Seq. ID No. 340
169	Seq. ID No. 347	Seq. ID No. 348
170	Seq. ID No. 349	Seq. ID No. 350
173	Seq. ID No. 357	Seq. ID No. 358
174	Seq. ID No. 359	Seq. ID No. 360
179a	Seq. ID No. 369	Seq. ID No. 370
179b	Seq. ID No. 371	Seq. ID No. 372
183a	Seq. ID No. 377	Seq. ID No. 378
187a	Seq. ID No. 385	Seq. ID No. 386
187b	Seq. ID No. 387	Seq. ID No. 388
191b	Seq. ID No. 393	Seq. ID No. 394
193	Seq. ID No. 399	Seq. ID No. 400
194a	Seq. ID No. 401	Seq. ID No. 402
194b	Seq. ID No. 403	Seq. ID No. 404
196	Seq. ID No. 407	Seq. ID No. 408
201a	Seq. ID No. 419	Seq. ID No. 420
207	Seq. ID No. 431	Seq. ID No. 432
235a	Seq. ID No. 477	Seq. ID No. 478

TABLE 17: UNIQUE ORFS

ORF Number	DNA SEQ ID Number	Protein SEQ ID Number
241	Seq. ID No. 495	Seq. ID No. 496
247	Seq. ID No. 507	Seq. ID No. 508
253a	Seq. ID No. 519	Seq. ID No. 520
260	Seq. ID No. 541	Seq. ID No. 542
263a	Seq. ID No. 545	Seq. ID No. 546
263b	Seq. ID No. 547	Seq. ID No. 548
264b	Seq. ID No. 549	Seq. ID No. 550
268	Seq. ID No. 557	Seq. ID No. 558
282	Seq. ID No. 589	Seq. ID No. 590
297	Seq. ID No. 617	Seq. ID No. 618
300b	Seq. ID No. 619	Seq. ID No. 620
309	Seq. ID No. 633	Seq. ID No. 634
313a	Seq. ID No. 639	Seq. ID No. 640
313b	Seq. ID No. 641	Seq. ID No. 642
313c	Seq. ID No. 643	Seq. ID No. 644
313d	Seq. ID No. 645	Seq. ID No. 646
313e	Seq. ID No. 647	Seq. ID No. 648
316a	Seq. ID No. 651	Seq. ID No. 652
317a	Seq. ID No. 653	Seq. ID No. 654
317b	Seq. ID No. 655	Seq. ID No. 656
320	Seq. ID No. 667	Seq. ID No. 668
331	Seq. ID No. 691	Seq. ID No. 692
332	Seq. ID No. 693	Seq. ID No. 694
333	Seq. ID No. 695	Seq. ID No. 696
334	Seq. ID No. 697	Seq. ID No. 698
342a	Seq. ID No. 715	Seq. ID No. 716
342b	Seq. ID No. 717	Seq. ID No. 718
342c	Seq. ID No. 719	Seq. ID No. 720
344a	Seq. ID No. 731	Seq. ID No. 732

TABLE 17: UNIQUE ORFs

ORF Number	DNA SEQ ID Number	Protein SEQ ID Number
344b	Seq. ID No. 733	Seq. ID No. 734
347	Seq. ID No. 741	Seq. ID No. 742
349a	Seq. ID No. 743	Seq. ID No. 744
349b	Seq. ID No. 745	Seq. ID No. 746
349c	Seq. ID No. 747	Seq. ID No. 748
350a	Seq. ID No. 749	Seq. ID No. 750
350b	Seq. ID No. 751	Seq. ID No. 752
352a	Seq. ID No. 755	Seq. ID No. 756
352b	Seq. ID No. 757	Seq. ID No. 758
352c	Seq. ID No. 759	Seq. ID No. 760
354a	Seq. ID No. 761	Seq. ID No. 762
354b	Seq. ID No. 763	Seq. ID No. 764
354c	Seq. ID No. 765	Seq. ID No. 766
355	Seq. ID No. 767	Seq. ID No. 768
372a	Seq. ID No. 801	Seq. ID No. 802
372b	Seq. ID No. 803	Seq. ID No. 804
372c	Seq. ID No. 805	Seq. ID No. 806
372d	Seq. ID No. 807	Seq. ID No. 808
374	Seq. ID No. 809	Seq. ID No. 810
377a	Seq. ID No. 811	Seq. ID No. 812
377b	Seq. ID No. 813	Seq. ID No. 814
386	Seq. ID No. 833	Seq. ID No. 834
393b	Seq. ID No. 841	Seq. ID No. 842
396	Seq. ID No. 849	Seq. ID No. 850
398	Seq. ID No. 851	Seq. ID No. 852
400a	Seq. ID No. 853	Seq. ID No. 854
400b	Seq. ID No. 855	Seq. ID No. 856
416a	Seq. ID No. 887	Seq. ID No. 888
416b	Seq. ID No. 889	Seq. ID No. 890

TABLE 17: UNIQUE ORFS

ORF Number	DNA SEQ ID Number	Protein SEQ ID Number
417	Seq. ID No. 891	Seq. ID No. 892
420a	Seq. ID No. 903	Seq. ID No. 904
420b	Seq. ID No. 905	Seq. ID No. 906
422	Seq. ID No. 909	Seq. ID No. 910
434	Seq. ID No. 937	Seq. ID No. 938
437b	Seq. ID No. 941	Seq. ID No. 942
437c	Seq. ID No. 943	Seq. ID No. 944
440	Seq. ID No. 951	Seq. ID No. 952
443b	Seq. ID No. 957	Seq. ID No. 958
451a	Seq. ID No. 973	Seq. ID No. 974
451b	Seq. ID No. 975	Seq. ID No. 976
454b	Seq. ID No. 987	Seq. ID No. 988
462	Seq. ID No. 1005	Seq. ID No. 1006
463a	Seq. ID No. 1007	Seq. ID No. 1008
463b	Seq. ID No. 1009	Seq. ID No. 1010
464a	Seq. ID No. 1011	Seq. ID No. 1012
465b	Seq. ID No. 1019	Seq. ID No. 1020
471a	Seq. ID No. 1025	Seq. ID No. 1026
471b	Seq. ID No. 1027	Seq. ID No. 1028
476	Seq. ID No. 1045	Seq. ID No. 1046
477b	Seq. ID No. 1047	Seq. ID No. 1048
491a	Seq. ID No. 1071	Seq. ID No. 1072
491b	Seq. ID No. 1073	Seq. ID No. 1074
494a	Seq. ID No. 1077	Seq. ID No. 1078
507a	Seq. ID No. 1105	Seq. ID No. 1106
507b	Seq. ID No. 1107	Seq. ID No. 1108
510	Seq. ID No. 1111	Seq. ID No. 1112
521b	Seq. ID No. 1131	Seq. ID No. 1132
524a	Seq. ID No. 1135	Seq. ID No. 1136

TABLE 17: UNIQUE ORFS

ORF Number	DNA SEQ ID Number	Protein SEQ ID Number
525	Seq. ID No. 1139	Seq. ID No. 1140
530a	Seq. ID No. 1151	Seq. ID No. 1152
530b	Seq. ID No. 1153	Seq. ID No. 1154
541a	Seq. ID No. 1165	Seq. ID No. 1166
541b	Seq. ID No. 1167	Seq. ID No. 1168
541c	Seq. ID No. 1169	Seq. ID No. 1170
541d	Seq. ID No. 1171	Seq. ID No. 1172
542	Seq. ID No. 1173	Seq. ID No. 1174
544	Seq. ID No. 1181	Seq. ID No. 1182
545a	Seq. ID No. 1183	Seq. ID No. 1184
545b	Seq. ID No. 1185	Seq. ID No. 1186
545c	Seq. ID No. 1187	Seq. ID No. 1188
546a	Seq. ID No. 1189	Seq. ID No. 1190
546b	Seq. ID No. 1191	Seq. ID No. 1192
546c	Seq. ID No. 1193	Seq. ID No. 1194
547a	Seq. ID No. 1195	Seq. ID No. 1196
547b	Seq. ID No. 1197	Seq. ID No. 1198
548	Seq. ID No. 1199	Seq. ID No. 1200
549b	Seq. ID No. 1201	Seq. ID No. 1202
550a	Seq. ID No. 1203	Seq. ID No. 1204
553c	Seq. ID No. 1207	Seq. ID No. 1208
556	Seq. ID No. 1213	Seq. ID No. 1214
564a	Seq. ID No. 1227	Seq. ID No. 1228
564b	Seq. ID No. 1229	Seq. ID No. 1230
571	Seq. ID No. 1239	Seq. ID No. 1240
576a	Seq. ID No. 1243	Seq. ID No. 1244
576b	Seq. ID No. 1245	Seq. ID No. 1246
578a	Seq. ID No. 1247	Seq. ID No. 1248
578b	Seq. ID No. 1249	Seq. ID No. 1250

TABLE 17: UNIQUE ORFs

ORF Number	DNA SEQ ID Number	Protein SEQ ID Number
585b	Seq. ID No. 1259	Seq. ID No. 1260
587a	Seq. ID No. 1265	Seq. ID No. 1266
587b	Seq. ID No. 1267	Seq. ID No. 1268
587c	Seq. ID No. 1269	Seq. ID No. 1270
587d	Seq. ID No. 1271	Seq. ID No. 1272
588a	Seq. ID No. 1273	Seq. ID No. 1274
588b	Seq. ID No. 1275	Seq. ID No. 1276
589a	Seq. ID No. 1277	Seq. ID No. 1278
589b	Seq. ID No. 1279	Seq. ID No. 1280
590	Seq. ID No. 1281	Seq. ID No. 1282
595a	Seq. ID No. 1283	Seq. ID No. 1284
595b	Seq. ID No. 1285	Seq. ID No. 1286
596a	Seq. ID No. 1287	Seq. ID No. 1288
596b	Seq. ID No. 1289	Seq. ID No. 1290
596c	Seq. ID No. 1291	Seq. ID No. 1292
597	Seq. ID No. 1293	Seq. ID No. 1294
598a	Seq. ID No. 1295	Seq. ID No. 1296
598b	Seq. ID No. 1297	Seq. ID No. 1298
599a	Seq. ID No. 1299	Seq. ID No. 1300
599b	Seq. ID No. 1301	Seq. ID No. 1302
600a	Seq. ID No. 1303	Seq. ID No. 1304
600b	Seq. ID No. 1305	Seq. ID No. 1306
603a	Seq. ID No. 1307	Seq. ID No. 1308
606	Seq. ID No. 1309	Seq. ID No. 1310
607a	Seq. ID No. 1311	Seq. ID No. 1312
607b	Seq. ID No. 1313	Seq. ID No. 1314
610a	Seq. ID No. 1319	Seq. ID No. 1320
610b	Seq. ID No. 1321	Seq. ID No. 1322
611	Seq. ID No. 1323	Seq. ID No. 1324

TABLE 17: UNIQUE ORFs

ORF Number	DNA SEQ ID Number	Protein SEQ ID Number
613a	Seq. ID No. 1325	Seq. ID No. 1326
613b	Seq. ID No. 1327	Seq. ID No. 1328
615b	Seq. ID No. 1337	Seq. ID No. 1338
619a	Seq. ID No. 1341	Seq. ID No. 1342
619b	Seq. ID No. 1343	Seq. ID No. 1344
623	Seq. ID No. 1347	Seq. ID No. 1348
624a	Seq. ID No. 1349	Seq. ID No. 1350
624b	Seq. ID No. 1351	Seq. ID No. 1352
624c	Seq. ID No. 1353	Seq. ID No. 1354
625	Seq. ID No. 1355	Seq. ID No. 1356
632b	Seq. ID No. 1371	Seq. ID No. 1372
634b	Seq. ID No. 1379	Seq. ID No. 1380
636	Seq. ID No. 1381	Seq. ID No. 1382
640	Seq. ID No. 1389	Seq. ID No. 1390
644a	Seq. ID No. 1397	Seq. ID No. 1398
644b	Seq. ID No. 1399	Seq. ID No. 1400
645	Seq. ID No. 1401	Seq. ID No. 1402
658a	Seq. ID No. 1417	Seq. ID No. 1418
658b	Seq. ID No. 1419	Seq. ID No. 1420
659a	Seq. ID No. 1421	Seq. ID No. 1422
659b	Seq. ID No. 1423	Seq. ID No. 1424
676	Seq. ID No. 1439	Seq. ID No. 1440
679a	Seq. ID No. 1445	Seq. ID No. 1446
679b	Seq. ID No. 1447	Seq. ID No. 1448
684	Seq. ID No. 1457	Seq. ID No. 1458
690	Seq. ID No. 1465	Seq. ID No. 1466
699b	Seq. ID No. 1479	Seq. ID No. 1480
721	Seq. ID No. 1511	Seq. ID No. 1512
739	Seq. ID No. 1551	Seq. ID No. 1552

TABLE 17: UNIQUE ORFs

ORF Number	DNA SEQ ID Number	Protein SEQ ID Number
740	Seq. ID No. 1553	Seq. ID No. 1554
741a	Seq. ID No. 1555	Seq. ID No. 1556
741b	Seq. ID No. 1557	Seq. ID No. 1558
749	Seq. ID No. 1579	Seq. ID No. 1580
764	Seq. ID No. 1609	Seq. ID No. 1610
772a	Seq. ID No. 1621	Seq. ID No. 1622
772b	Seq. ID No. 1623	Seq. ID No. 1624
774	Seq. ID No. 1625	Seq. ID No. 1626
775	Seq. ID No. 1627	Seq. ID No. 1628
777a	Seq. ID No. 1629	Seq. ID No. 1630
777c	Seq. ID No. 1631	Seq. ID No. 1632
779	Seq. ID No. 1633	Seq. ID No. 1634
782b	Seq. ID No. 1639	Seq. ID No. 1640
786b	Seq. ID No. 1643	Seq. ID No. 1644
791	Seq. ID No. 1655	Seq. ID No. 1656
795	Seq. ID No. 1667	Seq. ID No. 1668
799a	Seq. ID No. 1671	Seq. ID No. 1672
808	Seq. ID No. 1693	Seq. ID No. 1694
809b	Seq. ID No. 1695	Seq. ID No. 1696
816	Seq. ID No. 1701	Seq. ID No. 1702
820a	Seq. ID No. 1703	Seq. ID No. 1704
820b	Seq. ID No. 1705	Seq. ID No. 1706
835a	Seq. ID No. 1721	Seq. ID No. 1722
835b	Seq. ID No. 1723	Seq. ID No. 1724
837a	Seq. ID No. 1731	Seq. ID No. 1732
843	Seq. ID No. 1737	Seq. ID No. 1738
848	Seq. ID No. 1743	Seq. ID No. 1744
854	Seq. ID No. 1759	Seq. ID No. 1760
857	Seq. ID No. 1763	Seq. ID No. 1764

TABLE 17: UNIQUE ORFs

ORF Number	DNA SEQ ID Number	Protein SEQ ID Number
860	Seq. ID No. 1773	Seq. ID No. 1774
862	Seq. ID No. 1775	Seq. ID No. 1776
863	Seq. ID No. 1777	Seq. ID No. 1778
864a	Seq. ID No. 1779	Seq. ID No. 1780
864b	Seq. ID No. 1781	Seq. ID No. 1782
874a	Seq. ID No. 1799	Seq. ID No. 1800
874b	Seq. ID No. 1801	Seq. ID No. 1802
875	Seq. ID No. 1803	Seq. ID No. 1804
878a	Seq. ID No. 1807	Seq. ID No. 1808
887	Seq. ID No. 1823	Seq. ID No. 1824
894	Seq. ID No. 1831	Seq. ID No. 1832
917	Seq. ID No. 1851	Seq. ID No. 1852
919	Seq. ID No. 1857	Seq. ID No. 1858
931	Seq. ID No. 1875	Seq. ID No. 1876
943	Seq. ID No. 1899	Seq. ID No. 1900
950	Seq. ID No. 1915	Seq. ID No. 1916
955a	Seq. ID No. 1927	Seq. ID No. 1928
955b	Seq. ID No. 1929	Seq. ID No. 1930
978a	Seq. ID No. 1973	Seq. ID No. 1974
979	Seq. ID No. 1977	Seq. ID No. 1978
981a	Seq. ID No. 1981	Seq. ID No. 1982
993	Seq. ID No. 2005	Seq. ID No. 2006
994	Seq. ID No. 2007	Seq. ID No. 2008
995	Seq. ID No. 2009	Seq. ID No. 2010
997	Seq. ID No. 2011	Seq. ID No. 2012
999a	Seq. ID No. 2017	Seq. ID No. 2018
999b	Seq. ID No. 2019	Seq. ID No. 2020
1001	Seq. ID No. 2023	Seq. ID No. 2024
1003a	Seq. ID No. 2025	Seq. ID No. 2026

TABLE 17: UNIQUE ORFS

ORF Number	DNA SEQ ID Number	Protein SEQ ID Number
1003b	Seq. ID No. 2027	Seq. ID No. 2028
1012	Seq. ID No. 2039	Seq. ID No. 2040
1013a	Seq. ID No. 2041	Seq. ID No. 2042
1013b	Seq. ID No. 2043	Seq. ID No. 2044
1013c	Seq. ID No. 2045	Seq. ID No. 2046
1017a	Seq. ID No. 2049	Seq. ID No. 2050
1035a	Seq. ID No. 2081	Seq. ID No. 2082
1035b	Seq. ID No. 2083	Seq. ID No. 2084
1035c	Seq. ID No. 2085	Seq. ID No. 2086
1044a	Seq. ID No. 2105	Seq. ID No. 2106
1044b	Seq. ID No. 2107	Seq. ID No. 2108
1044c	Seq. ID No. 2109	Seq. ID No. 2110
1044d	Seq. ID No. 2111	Seq. ID No. 2112
1055	Seq. ID No. 2129	Seq. ID No. 2130
1056a	Seq. ID No. 2131	Seq. ID No. 2132
1056b	Seq. ID No. 2133	Seq. ID No. 2134
1063	Seq. ID No. 2145	Seq. ID No. 2146
1066a	Seq. ID No. 2155	Seq. ID No. 2156
1066b	Seq. ID No. 2157	Seq. ID No. 2158
1067	Seq. ID No. 2159	Seq. ID No. 2160
1069	Seq. ID No. 2161	Seq. ID No. 2162
1077a	Seq. ID No. 2171	Seq. ID No. 2172
1081a	Seq. ID No. 2187	Seq. ID No. 2188
1081b	Seq. ID No. 2189	Seq. ID No. 2190
1091a	Seq. ID No. 2201	Seq. ID No. 2202
1091b	Seq. ID No. 2203	Seq. ID No. 2204
1095a	Seq. ID No. 2209	Seq. ID No. 2210
1095b	Seq. ID No. 2211	Seq. ID No. 2212
1097	Seq. ID No. 2219	Seq. ID No. 2220

TABLE 17: UNIQUE ORFs

ORF Number	DNA SEQ ID Number	Protein SEQ ID Number
1101a	Seq. ID No. 2225	Seq. ID No. 2226
1112a	Seq. ID No. 2243	Seq. ID No. 2244
1125	Seq. ID No. 2245	Seq. ID No. 2246
1126a	Seq. ID No. 2247	Seq. ID No. 2248
1126b	Seq. ID No. 2249	Seq. ID No. 2250
1126c	Seq. ID No. 2251	Seq. ID No. 2252
1128	Seq. ID No. 2255	Seq. ID No. 2256
1141a	Seq. ID No. 2277	Seq. ID No. 2278
1141b	Seq. ID No. 2279	Seq. ID No. 2280
1162	Seq. ID No. 2341	Seq. ID No. 2342
1168	Seq. ID No. 2351	Seq. ID No. 2352
1169a	Seq. ID No. 2353	Seq. ID No. 2354
1169b	Seq. ID No. 2355	Seq. ID No. 2356
1169c	Seq. ID No. 2357	Seq. ID No. 2358
1170	Seq. ID No. 2359	Seq. ID No. 2360
1172	Seq. ID No. 2365	Seq. ID No. 2366
1173	Seq. ID No. 2367	Seq. ID No. 2368
1175	Seq. ID No. 2371	Seq. ID No. 2372
1178	Seq. ID No. 2375	Seq. ID No. 2376
1182a	Seq. ID No. 2393	Seq. ID No. 2394
1182b	Seq. ID No. 2395	Seq. ID No. 2396
1196a	Seq. ID No. 2425	Seq. ID No. 2426
1196b	Seq. ID No. 2427	Seq. ID No. 2428
1198	Seq. ID No. 2431	Seq. ID No. 2432
1201	Seq. ID No. 2439	Seq. ID No. 2440
1202a	Seq. ID No. 2441	Seq. ID No. 2442
1202b	Seq. ID No. 2443	Seq. ID No. 2444
1206	Seq. ID No. 2447	Seq. ID No. 2448
1212	Seq. ID No. 2459	Seq. ID No. 2460

TABLE 17: UNIQUE ORFS

ORF Number	DNA SEQ ID Number	Protein SEQ ID Number
1220	Seq. ID No. 2479	Seq. ID No. 2480
1225	Seq. ID No. 2493	Seq. ID No. 2494
1229b	Seq. ID No. 2501	Seq. ID No. 2502
1229c	Seq. ID No. 2503	Seq. ID No. 2504
1235	Seq. ID No. 2521	Seq. ID No. 2522
1236a	Seq. ID No. 2523	Seq. ID No. 2524
1239	Seq. ID No. 2527	Seq. ID No. 2528
1260	Seq. ID No. 2591	Seq. ID No. 2592
1267a	Seq. ID No. 2601	Seq. ID No. 2602
1267b	Seq. ID No. 2603	Seq. ID No. 2604
1270	Seq. ID No. 2611	Seq. ID No. 2612
1278a	Seq. ID No. 2627	Seq. ID No. 2628
1278b	Seq. ID No. 2629	Seq. ID No. 2630
1289	Seq. ID No. 2653	Seq. ID No. 2654
1294a	Seq. ID No. 2661	Seq. ID No. 2662
1314b	Seq. ID No. 2691	Seq. ID No. 2692
1316	Seq. ID No. 2695	Seq. ID No. 2696
1317	Seq. ID No. 2697	Seq. ID No. 2698
1323b	Seq. ID No. 2717	Seq. ID No. 2718
1334a	Seq. ID No. 2729	Seq. ID No. 2730
1334b	Seq. ID No. 2731	Seq. ID No. 2732
1335a	Seq. ID No. 2733	Seq. ID No. 2734
1335b	Seq. ID No. 2735	Seq. ID No. 2736
1338	Seq. ID No. 2739	Seq. ID No. 2740
1340a	Seq. ID No. 2741	Seq. ID No. 2742
1340b	Seq. ID No. 2743	Seq. ID No. 2744
1364a	Seq. ID No. 2777	Seq. ID No. 2778
1364b	Seq. ID No. 2779	Seq. ID No. 2780
1364c	Seq. ID No. 2781	Seq. ID No. 2782

TABLE 17: UNIQUE ORFS

ORF Number	DNA SEQ ID Number	Protein SEQ ID Number
1365b	Seq. ID No. 2783	Seq. ID No. 2784
1375	Seq. ID No. 2801	Seq. ID No. 2802
1378	Seq. ID No. 2805	Seq. ID No. 2806
1379	Seq. ID No. 2807	Seq. ID No. 2808
1380	Seq. ID No. 2809	Seq. ID No. 2810
1381a	Seq. ID No. 2811	Seq. ID No. 2812
1381b	Seq. ID No. 2813	Seq. ID No. 2814
1382	Seq. ID No. 2815	Seq. ID No. 2816
1383	Seq. ID No. 2817	Seq. ID No. 2818
1384a	Seq. ID No. 2819	Seq. ID No. 2820
1387a	Seq. ID No. 2829	Seq. ID No. 2830
1388b	Seq. ID No. 2831	Seq. ID No. 2832
1389a	Seq. ID No. 2833	Seq. ID No. 2834
1393a	Seq. ID No. 2835	Seq. ID No. 2836
1393b	Seq. ID No. 2837	Seq. ID No. 2838
1393c	Seq. ID No. 2839	Seq. ID No. 2840
1393d	Seq. ID No. 2841	Seq. ID No. 2842
1395a	Seq. ID No. 2845	Seq. ID No. 2846
1397	Seq. ID No. 2849	Seq. ID No. 2850
1398	Seq. ID No. 2851	Seq. ID No. 2852
1399a	Seq. ID No. 2853	Seq. ID No. 2854
1399b	Seq. ID No. 2855	Seq. ID No. 2856
1400	Seq. ID No. 2857	Seq. ID No. 2858
1401	Seq. ID No. 2859	Seq. ID No. 2860
1402c	Seq. ID No. 2861	Seq. ID No. 2862
1407b	Seq. ID No. 2865	Seq. ID No. 2866
1411a	Seq. ID No. 2873	Seq. ID No. 2874
1411b	Seq. ID No. 2875	Seq. ID No. 2876
1411c	Seq. ID No. 2877	Seq. ID No. 2878

TABLE 17: UNIQUE ORFs

ORF Number	DNA SEQ ID Number	Protein SEQ ID Number
1414a	Seq. ID No. 2883	Seq. ID No. 2884
1414b	Seq. ID No. 2885	Seq. ID No. 2886
1414c	Seq. ID No. 2887	Seq. ID No. 2888
1415	Seq. ID No. 2889	Seq. ID No. 2890
1418	Seq. ID No. 2893	Seq. ID No. 2894
1419	Seq. ID No. 2895	Seq. ID No. 2896
1423	Seq. ID No. 2903	Seq. ID No. 2904
1427a	Seq. ID No. 2909	Seq. ID No. 2910
1438	Seq. ID No. 2935	Seq. ID No. 2936
1439a	Seq. ID No. 2937	Seq. ID No. 2938
1439b	Seq. ID No. 2939	Seq. ID No. 2940
1439c	Seq. ID No. 2941	Seq. ID No. 2942
1439d	Seq. ID No. 2943	Seq. ID No. 2944
1439e	Seq. ID No. 2945	Seq. ID No. 2946
1440a	Seq. ID No. 2947	Seq. ID No. 2948
1440b	Seq. ID No. 2949	Seq. ID No. 2950
1440c	Seq. ID No. 2951	Seq. ID No. 2952
1440d	Seq. ID No. 2953	Seq. ID No. 2954
1446a	Seq. ID No. 2965	Seq. ID No. 2966
1446b	Seq. ID No. 2967	Seq. ID No. 2968
1448	Seq. ID No. 2973	Seq. ID No. 2974
1449a	Seq. ID No. 2975	Seq. ID No. 2976
1449b	Seq. ID No. 2977	Seq. ID No. 2978
1452a	Seq. ID No. 2981	Seq. ID No. 2982
1452b	Seq. ID No. 2983	Seq. ID No. 2984
1453	Seq. ID No. 2985	Seq. ID No. 2986
1454	Seq. ID No. 2987	Seq. ID No. 2988
1455a	Seq. ID No. 2989	Seq. ID No. 2990
1455b	Seq. ID No. 2991	Seq. ID No. 2992

TABLE 17: UNIQUE ORFS

ORF Number	DNA SEQ ID Number	Protein SEQ ID Number
1459	Seq. ID No. 3001	Seq. ID No. 3002
1463a	Seq. ID No. 3007	Seq. ID No. 3008
1463b	Seq. ID No. 3009	Seq. ID No. 3010
1463c	Seq. ID No. 3011	Seq. ID No. 3012
1467	Seq. ID No. 3021	Seq. ID No. 3022
1469a	Seq. ID No. 3023	Seq. ID No. 3024
1474	Seq. ID No. 3041	Seq. ID No. 3042
1476	Seq. ID No. 3045	Seq. ID No. 3046
1487	Seq. ID No. 3071	Seq. ID No. 3072
1489	Seq. ID No. 3087	Seq. ID No. 3088
1502a	Seq. ID No. 3105	Seq. ID No. 3106
1502b	Seq. ID No. 3107	Seq. ID No. 3108
1507a	Seq. ID No. 3119	Seq. ID No. 3120
1507b	Seq. ID No. 3121	Seq. ID No. 3122
1507c	Seq. ID No. 3123	Seq. ID No. 3124
1518a	Seq. ID No. 3151	Seq. ID No. 3152
1518b	Seq. ID No. 3153	Seq. ID No. 3154
1533a	Seq. ID No. 3167	Seq. ID No. 3168
1535a	Seq. ID No. 3173	Seq. ID No. 3174
1536a	Seq. ID No. 3175	Seq. ID No. 3176
1536b	Seq. ID No. 3177	Seq. ID No. 3178
1542	Seq. ID No. 3181	Seq. ID No. 3182
1552	Seq. ID No. 3193	Seq. ID No. 3194
1557a	Seq. ID No. 3213	Seq. ID No. 3214
1557b	Seq. ID No. 3215	Seq. ID No. 3216
1557c	Seq. ID No. 3217	Seq. ID No. 3218
1559a	Seq. ID No. 3219	Seq. ID No. 3220
1559b	Seq. ID No. 3221	Seq. ID No. 3222
1563	Seq. ID No. 3223	Seq. ID No. 3224

TABLE 17: UNIQUE ORFs

ORF Number	DNA SEQ ID Number	Protein SEQ ID Number
1567	Seq. ID No. 3231	Seq. ID No. 3232
1568b	Seq. ID No. 3233	Seq. ID No. 3234
1569	Seq. ID No. 3235	Seq. ID No. 3236
1570	Seq. ID No. 3237	Seq. ID No. 3238
1571	Seq. ID No. 3239	Seq. ID No. 3240
1572a	Seq. ID No. 3241	Seq. ID No. 3242
1572b	Seq. ID No. 3243	Seq. ID No. 3244
1572c	Seq. ID No. 3245	Seq. ID No. 3246
1572d	Seq. ID No. 3247	Seq. ID No. 3248
1572e	Seq. ID No. 3249	Seq. ID No. 3250
1580a	Seq. ID No. 3261	Seq. ID No. 3262
1580b	Seq. ID No. 3263	Seq. ID No. 3264
1581	Seq. ID No. 3265	Seq. ID No. 3266
1582a	Seq. ID No. 3267	Seq. ID No. 3268
1582b	Seq. ID No. 3269	Seq. ID No. 3270
1582c	Seq. ID No. 3271	Seq. ID No. 3272
1584	Seq. ID No. 3273	Seq. ID No. 3274
1585a	Seq. ID No. 3275	Seq. ID No. 3276
1585b	Seq. ID No. 3277	Seq. ID No. 3278
1608	Seq. ID No. 3325	Seq. ID No. 3326
1612	Seq. ID No. 3331	Seq. ID No. 3332
1621	Seq. ID No. 3339	Seq. ID No. 3340
1622a	Seq. ID No. 3341	Seq. ID No. 3342
1624	Seq. ID No. 3349	Seq. ID No. 3350
1628a	Seq. ID No. 3361	Seq. ID No. 3362
1628b	Seq. ID No. 3363	Seq. ID No. 3364
1633a	Seq. ID No. 3369	Seq. ID No. 3370
1633b	Seq. ID No. 3371	Seq. ID No. 3372
1646a	Seq. ID No. 3389	Seq. ID No. 3390

TABLE 17: UNIQUE ORFS

ORF Number	DNA SEQ ID Number	Protein SEQ ID Number
1648b	Seq. ID No. 3403	Seq. ID No. 3404
1656b	Seq. ID No. 3417	Seq. ID No. 3418
1657	Seq. ID No. 3419	Seq. ID No. 3420
1659a	Seq. ID No. 3421	Seq. ID No. 3422
1663	Seq. ID No. 3433	Seq. ID No. 3434
1665a	Seq. ID No. 3437	Seq. ID No. 3438
1669	Seq. ID No. 3441	Seq. ID No. 3442
1670a	Seq. ID No. 3443	Seq. ID No. 3444
1670b	Seq. ID No. 3445	Seq. ID No. 3446
1670c	Seq. ID No. 3447	Seq. ID No. 3448
1679	Seq. ID No. 3473	Seq. ID No. 3474
1683a	Seq. ID No. 3481	Seq. ID No. 3482
1683b	Seq. ID No. 3483	Seq. ID No. 3484
1687	Seq. ID No. 3489	Seq. ID No. 3490
1690a	Seq. ID No. 3503	Seq. ID No. 3504
1690b	Seq. ID No. 3505	Seq. ID No. 3506
1692	Seq. ID No. 3509	Seq. ID No. 3510
1693	Seq. ID No. 3511	Seq. ID No. 3512
1697a	Seq. ID No. 3523	Seq. ID No. 3524
1697b	Seq. ID No. 3525	Seq. ID No. 3526
1700a	Seq. ID No. 3531	Seq. ID No. 3532
1700b	Seq. ID No. 3533	Seq. ID No. 3534
1703b	Seq. ID No. 3539	Seq. ID No. 3540
1704a	Seq. ID No. 3541	Seq. ID No. 3542
1704b	Seq. ID No. 3543	Seq. ID No. 3544
1705a	Seq. ID No. 3545	Seq. ID No. 3546
1705b	Seq. ID No. 3547	Seq. ID No. 3548
1708	Seq. ID No. 3555	Seq. ID No. 3556
1709	Seq. ID No. 3557	Seq. ID No. 3558

TABLE 17: UNIQUE ORFS

ORF Number	DNA SEQ ID Number	Protein SEQ ID Number
1712a	Seq. ID No. 3563	Seq. ID No. 3564
1712b	Seq. ID No. 3565	Seq. ID No. 3566
1718a	Seq. ID No. 3571	Seq. ID No. 3572
1718b	Seq. ID No. 3573	Seq. ID No. 3574
1724	Seq. ID No. 3581	Seq. ID No. 3582
1731	Seq. ID No. 3587	Seq. ID No. 3588
1734	Seq. ID No. 3591	Seq. ID No. 3592
1735a	Seq. ID No. 3593	Seq. ID No. 3594
1735b	Seq. ID No. 3595	Seq. ID No. 3596
1743	Seq. ID No. 3611	Seq. ID No. 3612
1744a	Seq. ID No. 3613	Seq. ID No. 3614
1745	Seq. ID No. 3617	Seq. ID No. 3618
1747	Seq. ID No. 3619	Seq. ID No. 3620
1749a	Seq. ID No. 3621	Seq. ID No. 3622
1749b	Seq. ID No. 3623	Seq. ID No. 3624
1750a	Seq. ID No. 3625	Seq. ID No. 3626
1753	Seq. ID No. 3631	Seq. ID No. 3632
1757a	Seq. ID No. 3637	Seq. ID No. 3638
1757b	Seq. ID No. 3639	Seq. ID No. 3640
1766	Seq. ID No. 3655	Seq. ID No. 3656
1767a	Seq. ID No. 3657	Seq. ID No. 3658
1767b	Seq. ID No. 3659	Seq. ID No. 3660
1769a	Seq. ID No. 3661	Seq. ID No. 3662
1778a	Seq. ID No. 3677	Seq. ID No. 3678
1778b	Seq. ID No. 3679	Seq. ID No. 3680
1783a	Seq. ID No. 3683	Seq. ID No. 3684
1783b	Seq. ID No. 3685	Seq. ID No. 3686
1790a	Seq. ID No. 3701	Seq. ID No. 3702
1790b	Seq. ID No. 3703	Seq. ID No. 3704

TABLE 17: UNIQUE ORFs

ORF Number	DNA SEQ ID Number	Protein SEQ ID Number
1794a	Seq. ID No. 3717	Seq. ID No. 3718
1797a	Seq. ID No. 3719	Seq. ID No. 3720
1797b	Seq. ID No. 3721	Seq. ID No. 3722
1798a	Seq. ID No. 3723	Seq. ID No. 3724
1800	Seq. ID No. 3729	Seq. ID No. 3730
1802a	Seq. ID No. 3731	Seq. ID No. 3732
1802b	Seq. ID No. 3733	Seq. ID No. 3734
1803	Seq. ID No. 3735	Seq. ID No. 3736
1804a	Seq. ID No. 3737	Seq. ID No. 3738
1804b	Seq. ID No. 3739	Seq. ID No. 3740
1805	Seq. ID No. 3741	Seq. ID No. 3742
1807a	Seq. ID No. 3749	Seq. ID No. 3750
1807b	Seq. ID No. 3751	Seq. ID No. 3752
1808a	Seq. ID No. 3753	Seq. ID No. 3754
1808b	Seq. ID No. 3755	Seq. ID No. 3756
1809a	Seq. ID No. 3761	Seq. ID No. 3762
1812a	Seq. ID No. 3781	Seq. ID No. 3782
1812b	Seq. ID No. 3783	Seq. ID No. 3784
1813	Seq. ID No. 3785	Seq. ID No. 3786
1815a	Seq. ID No. 3787	Seq. ID No. 3788
1815b	Seq. ID No. 3789	Seq. ID No. 3790
1815c	Seq. ID No. 3791	Seq. ID No. 3792
1817a	Seq. ID No. 3799	Seq. ID No. 3800
1822	Seq. ID No. 3807	Seq. ID No. 3808
1823a	Seq. ID No. 3809	Seq. ID No. 3810
1823b	Seq. ID No. 3811	Seq. ID No. 3812
1825	Seq. ID No. 3813	Seq. ID No. 3814
1826a	Seq. ID No. 3815	Seq. ID No. 3816
1826b	Seq. ID No. 3817	Seq. ID No. 3818

TABLE 17: UNIQUE ORFs

ORF Number	DNA SEQ ID Number	Protein SEQ ID Number
1834	Seq. ID No. 3827	Seq. ID No. 3828
1835	Seq. ID No. 3829	Seq. ID No. 3830
1836a	Seq. ID No. 3831	Seq. ID No. 3832
1836b	Seq. ID No. 3833	Seq. ID No. 3834
1837	Seq. ID No. 3835	Seq. ID No. 3836
1842a	Seq. ID No. 3849	Seq. ID No. 3850
1854a	Seq. ID No. 3879	Seq. ID No. 3880
1854b	Seq. ID No. 3881	Seq. ID No. 3882
1858	Seq. ID No. 3895	Seq. ID No. 3896
1862a	Seq. ID No. 3903	Seq. ID No. 3904
1864a	Seq. ID No. 3909	Seq. ID No. 3910
1868	Seq. ID No. 3915	Seq. ID No. 3916
1882	Seq. ID No. 3939	Seq. ID No. 3940
1894c	Seq. ID No. 3959	Seq. ID No. 3960
1895	Seq. ID No. 3961	Seq. ID No. 3962
1896a	Seq. ID No. 3963	Seq. ID No. 3964
1896b	Seq. ID No. 3965	Seq. ID No. 3966
1898a	Seq. ID No. 3973	Seq. ID No. 3974
1899	Seq. ID No. 3977	Seq. ID No. 3978
1900	Seq. ID No. 3979	Seq. ID No. 3980
1916	Seq. ID No. 3993	Seq. ID No. 3994
1917a	Seq. ID No. 3995	Seq. ID No. 3996
1917b	Seq. ID No. 3997	Seq. ID No. 3998
1919a	Seq. ID No. 4005	Seq. ID No. 4006
1919b	Seq. ID No. 4007	Seq. ID No. 4008
1919c	Seq. ID No. 4009	Seq. ID No. 4010
1937a	Seq. ID No. 4041	Seq. ID No. 4042
1937b	Seq. ID No. 4043	Seq. ID No. 4044
1937c	Seq. ID No. 4045	Seq. ID No. 4046

TABLE 17: UNIQUE ORFS

ORF Number	DNA SEQ ID Number	Protein SEQ ID Number
1944	Seq. ID No. 4069	Seq. ID No. 4070
1949	Seq. ID No. 4077	Seq. ID No. 4078
1956	Seq. ID No. 4097	Seq. ID No. 4098
1961	Seq. ID No. 4113	Seq. ID No. 4114
1966	Seq. ID No. 4123	Seq. ID No. 4124
1970a	Seq. ID No. 4131	Seq. ID No. 4132
1970b	Seq. ID No. 4133	Seq. ID No. 4134
1972	Seq. ID No. 4135	Seq. ID No. 4136
1976	Seq. ID No. 4139	Seq. ID No. 4140
1980a	Seq. ID No. 4151	Seq. ID No. 4152
1980b	Seq. ID No. 4153	Seq. ID No. 4154
1981	Seq. ID No. 4155	Seq. ID No. 4156
1991	Seq. ID No. 4181	Seq. ID No. 4182
2016a	Seq. ID No. 4221	Seq. ID No. 4222
2023a	Seq. ID No. 4241	Seq. ID No. 4242
2025	Seq. ID No. 4253	Seq. ID No. 4254
2030a	Seq. ID No. 4257	Seq. ID No. 4258
2030b	Seq. ID No. 4259	Seq. ID No. 4260
2030c	Seq. ID No. 4261	Seq. ID No. 4262
2030d	Seq. ID No. 4263	Seq. ID No. 4264
2032c	Seq. ID No. 4265	Seq. ID No. 4266
2035b	Seq. ID No. 4269	Seq. ID No. 4270
2038a	Seq. ID No. 4275	Seq. ID No. 4276
2040a	Seq. ID No. 4277	Seq. ID No. 4278
2042	Seq. ID No. 4279	Seq. ID No. 4280
2043b	Seq. ID No. 4281	Seq. ID No. 4282
2045a	Seq. ID No. 4285	Seq. ID No. 4286
2045b	Seq. ID No. 4287	Seq. ID No. 4288
2049c	Seq. ID No. 4297	Seq. ID No. 4298

TABLE 17: UNIQUE ORFs

ORF Number	DNA SEQ ID Number	Protein SEQ ID Number
2055	Seq. ID No. 4305	Seq. ID No. 4306
2056	Seq. ID No. 4307	Seq. ID No. 4308
2081a	Seq. ID No. 4363	Seq. ID No. 4364
2081b	Seq. ID No. 4365	Seq. ID No. 4366
2087a	Seq. ID No. 4371	Seq. ID No. 4372
2087b	Seq. ID No. 4373	Seq. ID No. 4374
2098b	Seq. ID No. 4395	Seq. ID No. 4396
2101	Seq. ID No. 4399	Seq. ID No. 4400
2105	Seq. ID No. 4403	Seq. ID No. 4404
2114b	Seq. ID No. 4425	Seq. ID No. 4426
2120a	Seq. ID No. 4437	Seq. ID No. 4438
2120b	Seq. ID No. 4439	Seq. ID No. 4440
2122b	Seq. ID No. 4441	Seq. ID No. 4442
2127a	Seq. ID No. 4453	Seq. ID No. 4454
2127b	Seq. ID No. 4455	Seq. ID No. 4456
2159a	Seq. ID No. 4513	Seq. ID No. 4514
2159b	Seq. ID No. 4515	Seq. ID No. 4516
2175	Seq. ID No. 4551	Seq. ID No. 4552
2177b	Seq. ID No. 4561	Seq. ID No. 4562
2182	Seq. ID No. 4573	Seq. ID No. 4574
2183	Seq. ID No. 4575	Seq. ID No. 4576
2190a	Seq. ID No. 4587	Seq. ID No. 4588
2190b	Seq. ID No. 4589	Seq. ID No. 4590
2193	Seq. ID No. 4591	Seq. ID No. 4592
2194a	Seq. ID No. 4593	Seq. ID No. 4594
2194c	Seq. ID No. 4595	Seq. ID No. 4596
2208a	Seq. ID No. 4617	Seq. ID No. 4618
2208b	Seq. ID No. 4619	Seq. ID No. 4620
2208c	Seq. ID No. 4621	Seq. ID No. 4622

TABLE 17: UNIQUE ORFs

ORF Number	DNA SEQ ID Number	Protein SEQ ID Number
2212a	Seq. ID No. 4625	Seq. ID No. 4626
2212b	Seq. ID No. 4627	Seq. ID No. 4628
2216a	Seq. ID No. 4633	Seq. ID No. 4634
2216b	Seq. ID No. 4635	Seq. ID No. 4636
2218	Seq. ID No. 4637	Seq. ID No. 4638
2219a	Seq. ID No. 4639	Seq. ID No. 4640
2225	Seq. ID No. 4659	Seq. ID No. 4660
2236a	Seq. ID No. 4681	Seq. ID No. 4682
2239b	Seq. ID No. 4687	Seq. ID No. 4688
2243a	Seq. ID No. 4695	Seq. ID No. 4696
2245	Seq. ID No. 4699	Seq. ID No. 4700
2246	Seq. ID No. 4701	Seq. ID No. 4702
2257	Seq. ID No. 4721	Seq. ID No. 4722
2264a	Seq. ID No. 4735	Seq. ID No. 4736
2264b	Seq. ID No. 4737	Seq. ID No. 4738
2268	Seq. ID No. 4741	Seq. ID No. 4742
2285	Seq. ID No. 4783	Seq. ID No. 4784
2288	Seq. ID No. 4789	Seq. ID No. 4790
2294	Seq. ID No. 4805	Seq. ID No. 4806
2299	Seq. ID No. 4811	Seq. ID No. 4812
2302	Seq. ID No. 4817	Seq. ID No. 4818
2303	Seq. ID No. 4819	Seq. ID No. 4820
2304	Seq. ID No. 4821	Seq. ID No. 4822
2306c	Seq. ID No. 4823	Seq. ID No. 4824
2310	Seq. ID No. 4835	Seq. ID No. 4836
2320	Seq. ID No. 4853	Seq. ID No. 4854
2336	Seq. ID No. 4885	Seq. ID No. 4886
2350a	Seq. ID No. 4913	Seq. ID No. 4914
2360	Seq. ID No. 4923	Seq. ID No. 4924

TABLE 17: UNIQUE ORFs

ORF Number	DNA SEQ ID Number	Protein SEQ ID Number
2371a	Seq. ID No. 4949	Seq. ID No. 4950
2372	Seq. ID No. 4951	Seq. ID No. 4952
2382c	Seq. ID No. 4975	Seq. ID No. 4976
2386b	Seq. ID No. 4981	Seq. ID No. 4982
2386c	Seq. ID No. 4983	Seq. ID No. 4984
2390	Seq. ID No. 4987	Seq. ID No. 4988
2394	Seq. ID No. 4993	Seq. ID No. 4994
2397	Seq. ID No. 4999	Seq. ID No. 5000
2398	Seq. ID No. 5001	Seq. ID No. 5002
2402a	Seq. ID No. 5011	Seq. ID No. 5012
2402b	Seq. ID No. 5013	Seq. ID No. 5014
2407a	Seq. ID No. 5023	Seq. ID No. 5024
2412	Seq. ID No. 5031	Seq. ID No. 5032
2413a	Seq. ID No. 5033	Seq. ID No. 5034
2413b	Seq. ID No. 5035	Seq. ID No. 5036
2415a	Seq. ID No. 5037	Seq. ID No. 5038
2416b	Seq. ID No. 5041	Seq. ID No. 5042
2416c	Seq. ID No. 5043	Seq. ID No. 5044
2420	Seq. ID No. 5053	Seq. ID No. 5054
2423a	Seq. ID No. 5061	Seq. ID No. 5062
2423b	Seq. ID No. 5063	Seq. ID No. 5064
2434	Seq. ID No. 5085	Seq. ID No. 5086
2443	Seq. ID No. 5093	Seq. ID No. 5094
2463a	Seq. ID No. 5151	Seq. ID No. 5152
2464	Seq. ID No. 5153	Seq. ID No. 5154
2468a	Seq. ID No. 5159	Seq. ID No. 5160
2468b	Seq. ID No. 5161	Seq. ID No. 5162
2470	Seq. ID No. 5167	Seq. ID No. 5168
2474a	Seq. ID No. 5173	Seq. ID No. 5174

TABLE 17: UNIQUE ORFS

ORF Number	DNA SEQ ID Number	Protein SEQ ID Number
2474b	Seq. ID No. 5175	Seq. ID No. 5176
2474c	Seq. ID No. 5177	Seq. ID No. 5178
2481a	Seq. ID No. 5189	Seq. ID No. 5190
2481b	Seq. ID No. 5191	Seq. ID No. 5192
2482	Seq. ID No. 5193	Seq. ID No. 5194
2484a	Seq. ID No. 5197	Seq. ID No. 5198
2484b	Seq. ID No. 5199	Seq. ID No. 5200
2498b	Seq. ID No. 5221	Seq. ID No. 5222
2500a	Seq. ID No. 5223	Seq. ID No. 5224
2500b	Seq. ID No. 5225	Seq. ID No. 5226
2500c	Seq. ID No. 5227	Seq. ID No. 5228
2505	Seq. ID No. 5237	Seq. ID No. 5238
2518a	Seq. ID No. 5267	Seq. ID No. 5268
2519a	Seq. ID No. 5269	Seq. ID No. 5270
2519b	Seq. ID No. 5271	Seq. ID No. 5272
2521	Seq. ID No. 5281	Seq. ID No. 5282
2532b	Seq. ID No. 5301	Seq. ID No. 5302
2532c	Seq. ID No. 5303	Seq. ID No. 5304
2542a	Seq. ID No. 5315	Seq. ID No. 5316
2543	Seq. ID No. 5321	Seq. ID No. 5322
2546	Seq. ID No. 5327	Seq. ID No. 5328
2553	Seq. ID No. 5347	Seq. ID No. 5348
2567a	Seq. ID No. 5385	Seq. ID No. 5386
2605a	Seq. ID No. 5445	Seq. ID No. 5446
2605b	Seq. ID No. 5447	Seq. ID No. 5448
2616a	Seq. ID No. 5459	Seq. ID No. 5460
2616d	Seq. ID No. 5465	Seq. ID No. 5466
2616e	Seq. ID No. 5467	Seq. ID No. 5468
2618a	Seq. ID No. 5479	Seq. ID No. 5480

TABLE 17: UNIQUE ORFs

ORF Number	DNA SEQ ID Number	Protein SEQ ID Number
2618b	Seq. ID No. 5481	Seq. ID No. 5482
2620	Seq. ID No. 5485	Seq. ID No. 5486
2621a	Seq. ID No. 5487	Seq. ID No. 5488
2631	Seq. ID No. 5515	Seq. ID No. 5516
2632	Seq. ID No. 5517	Seq. ID No. 5518
2642	Seq. ID No. 5533	Seq. ID No. 5534
2648a	Seq. ID No. 5543	Seq. ID No. 5544
2648b	Seq. ID No. 5545	Seq. ID No. 5546
2650	Seq. ID No. 5549	Seq. ID No. 5550
2660	Seq. ID No. 5569	Seq. ID No. 5570
2665	Seq. ID No. 5577	Seq. ID No. 5578
2672	Seq. ID No. 5593	Seq. ID No. 5594
2673	Seq. ID No. 5595	Seq. ID No. 5596
2679a	Seq. ID No. 5609	Seq. ID No. 5610
2683a	Seq. ID No. 5623	Seq. ID No. 5624
2683b	Seq. ID No. 5625	Seq. ID No. 5626
2689a	Seq. ID No. 5639	Seq. ID No. 5640
2689b	Seq. ID No. 5641	Seq. ID No. 5642
2690a	Seq. ID No. 5643	Seq. ID No. 5644
2692b	Seq. ID No. 5649	Seq. ID No. 5650
2696a	Seq. ID No. 5659	Seq. ID No. 5660
2696b	Seq. ID No. 5661	Seq. ID No. 5662
2705	Seq. ID No. 5663	Seq. ID No. 5664
2710c	Seq. ID No. 5667	Seq. ID No. 5668
2713	Seq. ID No. 5671	Seq. ID No. 5672
2719a	Seq. ID No. 5687	Seq. ID No. 5688
2719b	Seq. ID No. 5689	Seq. ID No. 5690
2725a	Seq. ID No. 5703	Seq. ID No. 5704
2725b	Seq. ID No. 5705	Seq. ID No. 5706

TABLE 17: UNIQUE ORFs

ORF Number	DNA SEQ ID Number	Protein SEQ ID Number
2728a	Seq. ID No. 5709	Seq. ID No. 5710
2728b	Seq. ID No. 5711	Seq. ID No. 5712
2742a	Seq. ID No. 5737	Seq. ID No. 5738
2742b	Seq. ID No. 5739	Seq. ID No. 5740
2744	Seq. ID No. 5745	Seq. ID No. 5746
2746	Seq. ID No. 5751	Seq. ID No. 5752
2749a	Seq. ID No. 5763	Seq. ID No. 5764
2760a	Seq. ID No. 5797	Seq. ID No. 5798
2764	Seq. ID No. 5811	Seq. ID No. 5812
2765b	Seq. ID No. 5813	Seq. ID No. 5814
2765c	Seq. ID No. 5815	Seq. ID No. 5816
2769a	Seq. ID No. 5827	Seq. ID No. 5828
2770	Seq. ID No. 5829	Seq. ID No. 5830
2776a	Seq. ID No. 5843	Seq. ID No. 5844
2776b	Seq. ID No. 5845	Seq. ID No. 5846
2788b	Seq. ID No. 5873	Seq. ID No. 5874
2791	Seq. ID No. 5879	Seq. ID No. 5880
2794	Seq. ID No. 5883	Seq. ID No. 5884
2796a	Seq. ID No. 5885	Seq. ID No. 5886
2798	Seq. ID No. 5887	Seq. ID No. 5888
2799a	Seq. ID No. 5889	Seq. ID No. 5890
2799b	Seq. ID No. 5891	Seq. ID No. 5892
2819	Seq. ID No. 5931	Seq. ID No. 5932
2832	Seq. ID No. 5955	Seq. ID No. 5956
2837a	Seq. ID No. 5963	Seq. ID No. 5964
2837b	Seq. ID No. 5965	Seq. ID No. 5966
2845	Seq. ID No. 5975	Seq. ID No. 5976
2850	Seq. ID No. 5983	Seq. ID No. 5984
2851	Seq. ID No. 5985	Seq. ID No. 5986

TABLE 17: UNIQUE ORFs

ORF Number	DNA SEQ ID Number	Protein SEQ ID Number
2852	Seq. ID No. 5987	Seq. ID No. 5988
2853	Seq. ID No. 5989	Seq. ID No. 5990
2859	Seq. ID No. 6005	Seq. ID No. 6006
2862	Seq. ID No. 6013	Seq. ID No. 6014
2872	Seq. ID No. 6031	Seq. ID No. 6032
2877	Seq. ID No. 6035	Seq. ID No. 6036
2882	Seq. ID No. 6045	Seq. ID No. 6046
2887a	Seq. ID No. 6059	Seq. ID No. 6060
2887b	Seq. ID No. 6061	Seq. ID No. 6062
2888	Seq. ID No. 6063	Seq. ID No. 6064
2893b	Seq. ID No. 6073	Seq. ID No. 6074
2895	Seq. ID No. 6081	Seq. ID No. 6082
2901a	Seq. ID No. 6091	Seq. ID No. 6092
2901b	Seq. ID No. 6093	Seq. ID No. 6094
2917	Seq. ID No. 6127	Seq. ID No. 6128
2929b	Seq. ID No. 6159	Seq. ID No. 6160
2944b	Seq. ID No. 6197	Seq. ID No. 6198
2945b	Seq. ID No. 6199	Seq. ID No. 6200
2948a	Seq. ID No. 6203	Seq. ID No. 6204
2952	Seq. ID No. 6217	Seq. ID No. 6218
2955a	Seq. ID No. 6221	Seq. ID No. 6222
2955b	Seq. ID No. 6223	Seq. ID No. 6224
2958a	Seq. ID No. 6237	Seq. ID No. 6238
2958b	Seq. ID No. 6239	Seq. ID No. 6240
2958c	Seq. ID No. 6241	Seq. ID No. 6242
2960a	Seq. ID No. 6245	Seq. ID No. 6246
2962a	Seq. ID No. 6247	Seq. ID No. 6248
2962b	Seq. ID No. 6249	Seq. ID No. 6250
2966	Seq. ID No. 6259	Seq. ID No. 6260

TABLE 17: UNIQUE ORFs

ORF Number	DNA SEQ ID Number	Protein SEQ ID Number
2970a	Seq. ID No. 6265	Seq. ID No. 6266
2970b	Seq. ID No. 6267	Seq. ID No. 6268
2974a	Seq. ID No. 6273	Seq. ID No. 6274
2978a	Seq. ID No. 6283	Seq. ID No. 6284
2978b	Seq. ID No. 6285	Seq. ID No. 6286
2992	Seq. ID No. 6323	Seq. ID No. 6324
2993a	Seq. ID No. 6325	Seq. ID No. 6326
2993b	Seq. ID No. 6327	Seq. ID No. 6328
3015	Seq. ID No. 6361	Seq. ID No. 6362
3016a	Seq. ID No. 6363	Seq. ID No. 6364
3021	Seq. ID No. 6377	Seq. ID No. 6378
3023	Seq. ID No. 6381	Seq. ID No. 6382
3031a	Seq. ID No. 6401	Seq. ID No. 6402
3031b	Seq. ID No. 6403	Seq. ID No. 6404
3038	Seq. ID No. 6419	Seq. ID No. 6420
3042a	Seq. ID No. 6425	Seq. ID No. 6426
3042b	Seq. ID No. 6427	Seq. ID No. 6428
3043a	Seq. ID No. 6429	Seq. ID No. 6430
3043b	Seq. ID No. 6431	Seq. ID No. 6432
3044	Seq. ID No. 6433	Seq. ID No. 6434
3045a	Seq. ID No. 6435	Seq. ID No. 6436
3045b	Seq. ID No. 6437	Seq. ID No. 6438
3048a	Seq. ID No. 6439	Seq. ID No. 6440
3051a	Seq. ID No. 6447	Seq. ID No. 6448
3051b	Seq. ID No. 6449	Seq. ID No. 6450
3052	Seq. ID No. 6451	Seq. ID No. 6452
3054	Seq. ID No. 6453	Seq. ID No. 6454
3055a	Seq. ID No. 6455	Seq. ID No. 6456
3055b	Seq. ID No. 6457	Seq. ID No. 6458

TABLE 17: UNIQUE ORFS

ORF Number	DNA SEQ ID Number	Protein SEQ ID Number
3061	Seq. ID No. 6465	Seq. ID No. 6466
3062	Seq. ID No. 6467	Seq. ID No. 6468
3063a	Seq. ID No. 6469	Seq. ID No. 6470
3063b	Seq. ID No. 6471	Seq. ID No. 6472
3064b	Seq. ID No. 6473	Seq. ID No. 6474
3065a	Seq. ID No. 6475	Seq. ID No. 6476
3065b	Seq. ID No. 6477	Seq. ID No. 6478
3066	Seq. ID No. 6479	Seq. ID No. 6480
3067	Seq. ID No. 6481	Seq. ID No. 6482
3068	Seq. ID No. 6483	Seq. ID No. 6484
3069	Seq. ID No. 6485	Seq. ID No. 6486
3071	Seq. ID No. 6487	Seq. ID No. 6488
3072a	Seq. ID No. 6489	Seq. ID No. 6490
3073	Seq. ID No. 6491	Seq. ID No. 6492
3075	Seq. ID No. 6495	Seq. ID No. 6496
3076	Seq. ID No. 6497	Seq. ID No. 6498
3079	Seq. ID No. 6507	Seq. ID No. 6508
3085	Seq. ID No. 6517	Seq. ID No. 6518
3086	Seq. ID No. 6519	Seq. ID No. 6520
3087a	Seq. ID No. 6521	Seq. ID No. 6522
3087c	Seq. ID No. 6523	Seq. ID No. 6524
3088	Seq. ID No. 6525	Seq. ID No. 6526
3089a	Seq. ID No. 6527	Seq. ID No. 6528
3089b	Seq. ID No. 6529	Seq. ID No. 6530
3091	Seq. ID No. 6533	Seq. ID No. 6534
3095	Seq. ID No. 6539	Seq. ID No. 6540
3096a	Seq. ID No. 6541	Seq. ID No. 6542
3096b	Seq. ID No. 6543	Seq. ID No. 6544
3100a	Seq. ID No. 6555	Seq. ID No. 6556

TABLE 17: UNIQUE ORFS

ORF Number	DNA SEQ ID Number	Protein SEQ ID Number
3100b	Seq. ID No. 6557	Seq. ID No. 6558
3102	Seq. ID No. 6561	Seq. ID No. 6562
3103b	Seq. ID No. 6563	Seq. ID No. 6564
3104	Seq. ID No. 6565	Seq. ID No. 6566
3105	Seq. ID No. 6567	Seq. ID No. 6568
3106	Seq. ID No. 6569	Seq. ID No. 6570
3107a	Seq. ID No. 6571	Seq. ID No. 6572
3107b	Seq. ID No. 6573	Seq. ID No. 6574
3110a	Seq. ID No. 6581	Seq. ID No. 6582
3110b	Seq. ID No. 6583	Seq. ID No. 6584
3140	Seq. ID No. 6631	Seq. ID No. 6632
3145a	Seq. ID No. 6635	Seq. ID No. 6636
3145b	Seq. ID No. 6637	Seq. ID No. 6638
3145c	Seq. ID No. 6639	Seq. ID No. 6640
3147b	Seq. ID No. 6643	Seq. ID No. 6644
3147c	Seq. ID No. 6645	Seq. ID No. 6646
3149a	Seq. ID No. 6647	Seq. ID No. 6648
3150a	Seq. ID No. 6649	Seq. ID No. 6650

Listed in Table 18 are 1529 ORFs detected by the Glimmer™ ORF finder program.

TABLE 18: GLIMMER™ ORFS

ORF Number	DNA SEQ ID Number	Protein SEQ ID Number
1	Seq. ID No. 1	Seq. ID No. 2
2b	Seq. ID No. 5	Seq. ID No. 6
4c	Seq. ID No. 11	Seq. ID No. 12
5	Seq. ID No. 13	Seq. ID No. 14
7	Seq. ID No. 15	Seq. ID No. 16

TABLE 18: GLIMMER™ ORFs

ORF Number	DNA SEQ ID Number	Protein SEQ ID Number
10	Seq. ID No. 17	Seq. ID No. 18
17	Seq. ID No. 25	Seq. ID No. 26
18	Seq. ID No. 27	Seq. ID No. 28
20	Seq. ID No. 29	Seq. ID No. 30
23b	Seq. ID No. 35	Seq. ID No. 36
24	Seq. ID No. 37	Seq. ID No. 38
36	Seq. ID No. 41	Seq. ID No. 42
37	Seq. ID No. 43	Seq. ID No. 44
38b	Seq. ID No. 47	Seq. ID No. 48
39b	Seq. ID No. 51	Seq. ID No. 52
40	Seq. ID No. 53	Seq. ID No. 54
41c	Seq. ID No. 59	Seq. ID No. 60
43c	Seq. ID No. 63	Seq. ID No. 64
45	Seq. ID No. 69	Seq. ID No. 70
46b	Seq. ID No. 73	Seq. ID No. 74
47	Seq. ID No. 75	Seq. ID No. 76
48c	Seq. ID No. 81	Seq. ID No. 82
50	Seq. ID No. 83	Seq. ID No. 84
51c	Seq. ID No. 89	Seq. ID No. 90
56b	Seq. ID No. 93	Seq. ID No. 94
57b	Seq. ID No. 97	Seq. ID No. 98
60b	Seq. ID No. 103	Seq. ID No. 104
62c	Seq. ID No. 111	Seq. ID No. 112
65c	Seq. ID No. 121	Seq. ID No. 122
67	Seq. ID No. 125	Seq. ID No. 126
71	Seq. ID No. 129	Seq. ID No. 130
74	Seq. ID No. 135	Seq. ID No. 136
77	Seq. ID No. 137	Seq. ID No. 138
80c	Seq. ID No. 145	Seq. ID No. 146

TABLE 18: GLIMMER™ ORFS

ORF Number	DNA SEQ ID Number	Protein SEQ ID Number
81b	Seq. ID No. 149	Seq. ID No. 150
85c	Seq. ID No. 157	Seq. ID No. 158
88	Seq. ID No. 167	Seq. ID No. 168
91b	Seq. ID No. 173	Seq. ID No. 174
93c	Seq. ID No. 183	Seq. ID No. 184
95b	Seq. ID No. 187	Seq. ID No. 188
97b	Seq. ID No. 189	Seq. ID No. 190
99	Seq. ID No. 191	Seq. ID No. 192
102	Seq. ID No. 195	Seq. ID No. 196
104a	Seq. ID No. 197	Seq. ID No. 198
105a	Seq. ID No. 203	Seq. ID No. 204
106	Seq. ID No. 207	Seq. ID No. 208
109d	Seq. ID No. 215	Seq. ID No. 216
111b	Seq. ID No. 219	Seq. ID No. 220
112b	Seq. ID No. 223	Seq. ID No. 224
114	Seq. ID No. 225	Seq. ID No. 226
115	Seq. ID No. 227	Seq. ID No. 228
119b	Seq. ID No. 231	Seq. ID No. 232
121	Seq. ID No. 233	Seq. ID No. 234
124c	Seq. ID No. 239	Seq. ID No. 240
125	Seq. ID No. 241	Seq. ID No. 242
127c	Seq. ID No. 247	Seq. ID No. 248
129c	Seq. ID No. 253	Seq. ID No. 254
134	Seq. ID No. 261	Seq. ID No. 262
135b	Seq. ID No. 265	Seq. ID No. 266
137b	Seq. ID No. 269	Seq. ID No. 270
138b	Seq. ID No. 273	Seq. ID No. 274
142	Seq. ID No. 275	Seq. ID No. 276
143	Seq. ID No. 277	Seq. ID No. 278

TABLE 18: GLIMMER™ ORFS

ORF Number	DNA SEQ ID Number	Protein SEQ ID Number
144c	Seq. ID No. 283	Seq. ID No. 284
145d	Seq. ID No. 291	Seq. ID No. 292
147	Seq. ID No. 293	Seq. ID No. 294
151b	Seq. ID No. 297	Seq. ID No. 298
152b	Seq. ID No. 301	Seq. ID No. 302
153c	Seq. ID No. 307	Seq. ID No. 308
154	Seq. ID No. 309	Seq. ID No. 310
155b	Seq. ID No. 313	Seq. ID No. 314
157b	Seq. ID No. 317	Seq. ID No. 318
158b	Seq. ID No. 321	Seq. ID No. 322
160b	Seq. ID No. 325	Seq. ID No. 326
162e	Seq. ID No. 335	Seq. ID No. 336
165b	Seq. ID No. 343	Seq. ID No. 344
167	Seq. ID No. 345	Seq. ID No. 346
171b	Seq. ID No. 353	Seq. ID No. 354
172	Seq. ID No. 355	Seq. ID No. 356
175	Seq. ID No. 361	Seq. ID No. 362
176	Seq. ID No. 363	Seq. ID No. 364
177b	Seq. ID No. 367	Seq. ID No. 368
180b	Seq. ID No. 375	Seq. ID No. 376
184	Seq. ID No. 379	Seq. ID No. 380
186	Seq. ID No. 383	Seq. ID No. 384
188	Seq. ID No. 389	Seq. ID No. 390
189b	Seq. ID No. 391	Seq. ID No. 392
192b	Seq. ID No. 397	Seq. ID No. 398
195	Seq. ID No. 405	Seq. ID No. 406
197b	Seq. ID No. 411	Seq. ID No. 412
198b	Seq. ID No. 415	Seq. ID No. 416
200	Seq. ID No. 417	Seq. ID No. 418

TABLE 18: GLIMMER™ ORFs

ORF Number	DNA SEQ ID Number	Protein SEQ ID Number
203	Seq. ID No. 423	Seq. ID No. 424
204	Seq. ID No. 425	Seq. ID No. 426
205	Seq. ID No. 427	Seq. ID No. 428
206	Seq. ID No. 429	Seq. ID No. 430
208b	Seq. ID No. 435	Seq. ID No. 436
210	Seq. ID No. 437	Seq. ID No. 438
211	Seq. ID No. 439	Seq. ID No. 440
213	Seq. ID No. 441	Seq. ID No. 442
218	Seq. ID No. 445	Seq. ID No. 446
219	Seq. ID No. 447	Seq. ID No. 448
220c	Seq. ID No. 453	Seq. ID No. 454
226b	Seq. ID No. 461	Seq. ID No. 462
227	Seq. ID No. 463	Seq. ID No. 464
228d	Seq. ID No. 471	Seq. ID No. 472
236c	Seq. ID No. 485	Seq. ID No. 486
245c	Seq. ID No. 501	Seq. ID No. 502
246b	Seq. ID No. 505	Seq. ID No. 506
248b	Seq. ID No. 511	Seq. ID No. 512
249b	Seq. ID No. 515	Seq. ID No. 516
251	Seq. ID No. 517	Seq. ID No. 518
253b	Seq. ID No. 521	Seq. ID No. 522
254	Seq. ID No. 523	Seq. ID No. 524
255d	Seq. ID No. 531	Seq. ID No. 532
258	Seq. ID No. 533	Seq. ID No. 534
259c	Seq. ID No. 539	Seq. ID No. 540
260	Seq. ID No. 541	Seq. ID No. 542
262	Seq. ID No. 543	Seq. ID No. 544
265	Seq. ID No. 551	Seq. ID No. 552
267c	Seq. ID No. 555	Seq. ID No. 556

TABLE 18: GLIMMER™ ORFs

ORF Number	DNA SEQ ID Number	Protein SEQ ID Number
269b	Seq. ID No. 561	Seq. ID No. 562
271b	Seq. ID No. 565	Seq. ID No. 566
273b	Seq. ID No. 569	Seq. ID No. 570
277c	Seq. ID No. 575	Seq. ID No. 576
279b	Seq. ID No. 579	Seq. ID No. 580
280d	Seq. ID No. 587	Seq. ID No. 588
283b	Seq. ID No. 593	Seq. ID No. 594
284b	Seq. ID No. 597	Seq. ID No. 598
286b	Seq. ID No. 603	Seq. ID No. 604
287	Seq. ID No. 605	Seq. ID No. 606
290b	Seq. ID No. 609	Seq. ID No. 610
293	Seq. ID No. 611	Seq. ID No. 612
294	Seq. ID No. 613	Seq. ID No. 614
296	Seq. ID No. 615	Seq. ID No. 616
301b	Seq. ID No. 623	Seq. ID No. 624
304b	Seq. ID No. 627	Seq. ID No. 628
307	Seq. ID No. 629	Seq. ID No. 630
308	Seq. ID No. 631	Seq. ID No. 632
310	Seq. ID No. 635	Seq. ID No. 636
311	Seq. ID No. 637	Seq. ID No. 638
313e	Seq. ID No. 647	Seq. ID No. 648
315	Seq. ID No. 649	Seq. ID No. 650
318c	Seq. ID No. 661	Seq. ID No. 662
321	Seq. ID No. 669	Seq. ID No. 670
323b	Seq. ID No. 673	Seq. ID No. 674
324	Seq. ID No. 675	Seq. ID No. 676
327c	Seq. ID No. 681	Seq. ID No. 682
329	Seq. ID No. 683	Seq. ID No. 684
330c	Seq. ID No. 689	Seq. ID No. 690

TABLE 18: GLIMMER™ ORFs

ORF Number	DNA SEQ ID Number	Protein SEQ ID Number
335b	Seq. ID No. 701	Seq. ID No. 702
337	Seq. ID No. 703	Seq. ID No. 704
338c	Seq. ID No. 709	Seq. ID No. 710
341b	Seq. ID No. 713	Seq. ID No. 714
342h	Seq. ID No. 729	Seq. ID No. 730
344b	Seq. ID No. 733	Seq. ID No. 734
345	Seq. ID No. 735	Seq. ID No. 736
346a	Seq. ID No. 737	Seq. ID No. 738
347	Seq. ID No. 741	Seq. ID No. 742
349c	Seq. ID No. 747	Seq. ID No. 748
350b	Seq. ID No. 751	Seq. ID No. 752
351	Seq. ID No. 753	Seq. ID No. 754
352c	Seq. ID No. 759	Seq. ID No. 760
354c	Seq. ID No. 765	Seq. ID No. 766
355	Seq. ID No. 767	Seq. ID No. 768
356b	Seq. ID No. 771	Seq. ID No. 772
358c	Seq. ID No. 781	Seq. ID No. 782
362	Seq. ID No. 783	Seq. ID No. 784
365b	Seq. ID No. 787	Seq. ID No. 788
366c	Seq. ID No. 791	Seq. ID No. 792
367b	Seq. ID No. 795	Seq. ID No. 796
371b	Seq. ID No. 799	Seq. ID No. 800
372d	Seq. ID No. 807	Seq. ID No. 808
378b	Seq. ID No. 817	Seq. ID No. 818
382b	Seq. ID No. 819	Seq. ID No. 820
383b	Seq. ID No. 823	Seq. ID No. 824
384b	Seq. ID No. 827	Seq. ID No. 828
385b	Seq. ID No. 831	Seq. ID No. 832
387	Seq. ID No. 835	Seq. ID No. 836

TABLE 18: GLIMMER™ ORFs

ORF Number	DNA SEQ ID Number	Protein SEQ ID Number
390	Seq. ID No. 837	Seq. ID No. 838
391	Seq. ID No. 839	Seq. ID No. 840
395c	Seq. ID No. 847	Seq. ID No. 848
398	Seq. ID No. 851	Seq. ID No. 852
400b	Seq. ID No. 855	Seq. ID No. 856
401b	Seq. ID No. 859	Seq. ID No. 860
403d	Seq. ID No. 867	Seq. ID No. 868
406b	Seq. ID No. 871	Seq. ID No. 872
409b	Seq. ID No. 875	Seq. ID No. 876
410c	Seq. ID No. 881	Seq. ID No. 882
413b	Seq. ID No. 885	Seq. ID No. 886
416b	Seq. ID No. 889	Seq. ID No. 890
417	Seq. ID No. 891	Seq. ID No. 892
418b	Seq. ID No. 895	Seq. ID No. 896
419c	Seq. ID No. 901	Seq. ID No. 902
421	Seq. ID No. 907	Seq. ID No. 908
424c	Seq. ID No. 915	Seq. ID No. 916
426b	Seq. ID No. 919	Seq. ID No. 920
427c	Seq. ID No. 925	Seq. ID No. 926
429b	Seq. ID No. 929	Seq. ID No. 930
431	Seq. ID No. 935	Seq. ID No. 936
435	Seq. ID No. 939	Seq. ID No. 940
438c	Seq. ID No. 949	Seq. ID No. 950
440	Seq. ID No. 951	Seq. ID No. 952
441b	Seq. ID No. 955	Seq. ID No. 956
444b	Seq. ID No. 961	Seq. ID No. 962
445b	Seq. ID No. 965	Seq. ID No. 966
448	Seq. ID No. 967	Seq. ID No. 968
450b	Seq. ID No. 971	Seq. ID No. 972

TABLE 18: GLIMMER™ ORFS

ORF Number	DNA SEQ ID Number	Protein SEQ ID Number
452e	Seq. ID No. 985	Seq. ID No. 986
455c	Seq. ID No. 993	Seq. ID No. 994
458b	Seq. ID No. 997	Seq. ID No. 998
460c	Seq. ID No. 1003	Seq. ID No. 1004
462	Seq. ID No. 1005	Seq. ID No. 1006
463b	Seq. ID No. 1009	Seq. ID No. 1010
464d	Seq. ID No. 1017	Seq. ID No. 1018
467b	Seq. ID No. 1023	Seq. ID No. 1024
472f	Seq. ID No. 1039	Seq. ID No. 1040
473	Seq. ID No. 1041	Seq. ID No. 1042
474	Seq. ID No. 1043	Seq. ID No. 1044
478b	Seq. ID No. 1051	Seq. ID No. 1052
479	Seq. ID No. 1053	Seq. ID No. 1054
480b	Seq. ID No. 1057	Seq. ID No. 1058
481b	Seq. ID No. 1061	Seq. ID No. 1062
482b	Seq. ID No. 1065	Seq. ID No. 1066
483	Seq. ID No. 1067	Seq. ID No. 1068
490	Seq. ID No. 1069	Seq. ID No. 1070
491b	Seq. ID No. 1073	Seq. ID No. 1074
492	Seq. ID No. 1075	Seq. ID No. 1076
495c	Seq. ID No. 1083	Seq. ID No. 1084
498b	Seq. ID No. 1087	Seq. ID No. 1088
499b	Seq. ID No. 1091	Seq. ID No. 1092
500	Seq. ID No. 1093	Seq. ID No. 1094
502c	Seq. ID No. 1097	Seq. ID No. 1098
504	Seq. ID No. 1099	Seq. ID No. 1100
505b	Seq. ID No. 1103	Seq. ID No. 1104
509	Seq. ID No. 1109	Seq. ID No. 1110
512b	Seq. ID No. 1115	Seq. ID No. 1116

TABLE 18: GLIMMER™ ORFs

ORF Number	DNA SEQ ID Number	Protein SEQ ID Number
514	Seq. ID No. 1117	Seq. ID No. 1118
515c	Seq. ID No. 1123	Seq. ID No. 1124
518c	Seq. ID No. 1129	Seq. ID No. 1130
523	Seq. ID No. 1133	Seq. ID No. 1134
524b	Seq. ID No. 1137	Seq. ID No. 1138
527b	Seq. ID No. 1143	Seq. ID No. 1144
528b	Seq. ID No. 1147	Seq. ID No. 1148
529	Seq. ID No. 1149	Seq. ID No. 1150
533	Seq. ID No. 1155	Seq. ID No. 1156
535	Seq. ID No. 1157	Seq. ID No. 1158
536	Seq. ID No. 1159	Seq. ID No. 1160
539c	Seq. ID No. 1163	Seq. ID No. 1164
541d	Seq. ID No. 1171	Seq. ID No. 1172
543c	Seq. ID No. 1179	Seq. ID No. 1180
544	Seq. ID No. 1181	Seq. ID No. 1182
545c	Seq. ID No. 1187	Seq. ID No. 1188
546c	Seq. ID No. 1193	Seq. ID No. 1194
548	Seq. ID No. 1199	Seq. ID No. 1200
551	Seq. ID No. 1205	Seq. ID No. 1206
554b	Seq. ID No. 1211	Seq. ID No. 1212
557b	Seq. ID No. 1217	Seq. ID No. 1218
560b	Seq. ID No. 1221	Seq. ID No. 1222
561	Seq. ID No. 1223	Seq. ID No. 1224
563	Seq. ID No. 1225	Seq. ID No. 1226
564c	Seq. ID No. 1231	Seq. ID No. 1232
569	Seq. ID No. 1233	Seq. ID No. 1234
570b	Seq. ID No. 1237	Seq. ID No. 1238
573	Seq. ID No. 1241	Seq. ID No. 1242
580b	Seq. ID No. 1253	Seq. ID No. 1254

TABLE 18: GLIMMER™ ORFs

ORF Number	DNA SEQ ID Number	Protein SEQ ID Number
583b	Seq. ID No. 1257	Seq. ID No. 1258
586b	Seq. ID No. 1263	Seq. ID No. 1264
587d	Seq. ID No. 1271	Seq. ID No. 1272
590	Seq. ID No. 1281	Seq. ID No. 1282
609b	Seq. ID No. 1317	Seq. ID No. 1318
611	Seq. ID No. 1323	Seq. ID No. 1324
613d	Seq. ID No. 1331	Seq. ID No. 1332
614b	Seq. ID No. 1335	Seq. ID No. 1336
618	Seq. ID No. 1339	Seq. ID No. 1340
620	Seq. ID No. 1345	Seq. ID No. 1346
623	Seq. ID No. 1347	Seq. ID No. 1348
626c	Seq. ID No. 1361	Seq. ID No. 1362
631d	Seq. ID No. 1369	Seq. ID No. 1370
633c	Seq. ID No. 1377	Seq. ID No. 1378
634b	Seq. ID No. 1379	Seq. ID No. 1380
637c	Seq. ID No. 1387	Seq. ID No. 1388
641b	Seq. ID No. 1393	Seq. ID No. 1394
643	Seq. ID No. 1395	Seq. ID No. 1396
644b	Seq. ID No. 1399	Seq. ID No. 1400
650	Seq. ID No. 1403	Seq. ID No. 1404
652	Seq. ID No. 1405	Seq. ID No. 1406
653c	Seq. ID No. 1411	Seq. ID No. 1412
656	Seq. ID No. 1413	Seq. ID No. 1414
657c	Seq. ID No. 1415	Seq. ID No. 1416
658b	Seq. ID No. 1419	Seq. ID No. 1420
661	Seq. ID No. 1425	Seq. ID No. 1426
663	Seq. ID No. 1427	Seq. ID No. 1428
665	Seq. ID No. 1429	Seq. ID No. 1430
666	Seq. ID No. 1431	Seq. ID No. 1432

TABLE 18: GLIMMER™ ORFS

ORF Number	DNA SEQ ID Number	Protein SEQ ID Number
670	Seq. ID No. 1433	Seq. ID No. 1434
674b	Seq. ID No. 1437	Seq. ID No. 1438
677b	Seq. ID No. 1443	Seq. ID No. 1444
680	Seq. ID No. 1449	Seq. ID No. 1450
681	Seq. ID No. 1451	Seq. ID No. 1452
683b	Seq. ID No. 1455	Seq. ID No. 1456
684	Seq. ID No. 1457	Seq. ID No. 1458
687	Seq. ID No. 1459	Seq. ID No. 1460
688b	Seq. ID No. 1463	Seq. ID No. 1464
690	Seq. ID No. 1465	Seq. ID No. 1466
691b	Seq. ID No. 1469	Seq. ID No. 1470
692	Seq. ID No. 1471	Seq. ID No. 1472
694	Seq. ID No. 1473	Seq. ID No. 1474
696	Seq. ID No. 1475	Seq. ID No. 1476
698	Seq. ID No. 1477	Seq. ID No. 1478
700c	Seq. ID No. 1485	Seq. ID No. 1486
703	Seq. ID No. 1487	Seq. ID No. 1488
705b	Seq. ID No. 1491	Seq. ID No. 1492
707	Seq. ID No. 1493	Seq. ID No. 1494
709	Seq. ID No. 1495	Seq. ID No. 1496
710	Seq. ID No. 1497	Seq. ID No. 1498
712b	Seq. ID No. 1501	Seq. ID No. 1502
715b	Seq. ID No. 1505	Seq. ID No. 1506
717	Seq. ID No. 1507	Seq. ID No. 1508
718a	Seq. ID No. 1509	Seq. ID No. 1510
722c	Seq. ID No. 1517	Seq. ID No. 1518
724d	Seq. ID No. 1525	Seq. ID No. 1526
726	Seq. ID No. 1527	Seq. ID No. 1528
728b	Seq. ID No. 1531	Seq. ID No. 1532

TABLE 18: GLIMMER™ ORFS

ORF Number	DNA SEQ ID Number	Protein SEQ ID Number
730d	Seq. ID No. 1539	Seq. ID No. 1540
731b	Seq. ID No. 1541	Seq. ID No. 1542
732	Seq. ID No. 1543	Seq. ID No. 1544
738c	Seq. ID No. 1549	Seq. ID No. 1550
743b	Seq. ID No. 1561	Seq. ID No. 1562
744	Seq. ID No. 1563	Seq. ID No. 1564
745b	Seq. ID No. 1567	Seq. ID No. 1568
746b	Seq. ID No. 1571	Seq. ID No. 1572
747	Seq. ID No. 1573	Seq. ID No. 1574
748b	Seq. ID No. 1577	Seq. ID No. 1578
751	Seq. ID No. 1581	Seq. ID No. 1582
754d	Seq. ID No. 1589	Seq. ID No. 1590
756b	Seq. ID No. 1593	Seq. ID No. 1594
758	Seq. ID No. 1595	Seq. ID No. 1596
760	Seq. ID No. 1597	Seq. ID No. 1598
762c	Seq. ID No. 1603	Seq. ID No. 1604
763b	Seq. ID No. 1607	Seq. ID No. 1608
766	Seq. ID No. 1611	Seq. ID No. 1612
767	Seq. ID No. 1613	Seq. ID No. 1614
770c	Seq. ID No. 1619	Seq. ID No. 1620
772b	Seq. ID No. 1623	Seq. ID No. 1624
775	Seq. ID No. 1627	Seq. ID No. 1628
777c	Seq. ID No. 1631	Seq. ID No. 1632
780b	Seq. ID No. 1637	Seq. ID No. 1638
782b	Seq. ID No. 1639	Seq. ID No. 1640
785	Seq. ID No. 1641	Seq. ID No. 1642
788b	Seq. ID No. 1647	Seq. ID No. 1648
789c	Seq. ID No. 1653	Seq. ID No. 1654
792	Seq. ID No. 1657	Seq. ID No. 1658

TABLE 18: GLIMMER™ ORFs

ORF Number	DNA SEQ ID Number	Protein SEQ ID Number
794d	Seq. ID No. 1665	Seq. ID No. 1666
797	Seq. ID No. 1669	Seq. ID No. 1670
799f	Seq. ID No. 1681	Seq. ID No. 1682
803b	Seq. ID No. 1685	Seq. ID No. 1686
804b	Seq. ID No. 1689	Seq. ID No. 1690
807	Seq. ID No. 1691	Seq. ID No. 1692
812	Seq. ID No. 1697	Seq. ID No. 1698
813	Seq. ID No. 1699	Seq. ID No. 1700
826	Seq. ID No. 1707	Seq. ID No. 1708
829b	Seq. ID No. 1711	Seq. ID No. 1712
830	Seq. ID No. 1713	Seq. ID No. 1714
834c	Seq. ID No. 1719	Seq. ID No. 1720
835b	Seq. ID No. 1723	Seq. ID No. 1724
836c	Seq. ID No. 1729	Seq. ID No. 1730
837c	Seq. ID No. 1735	Seq. ID No. 1736
843	Seq. ID No. 1737	Seq. ID No. 1738
847b	Seq. ID No. 1741	Seq. ID No. 1742
849b	Seq. ID No. 1747	Seq. ID No. 1748
851b	Seq. ID No. 1751	Seq. ID No. 1752
853c	Seq. ID No. 1757	Seq. ID No. 1758
854	Seq. ID No. 1759	Seq. ID No. 1760
855	Seq. ID No. 1761	Seq. ID No. 1762
859d	Seq. ID No. 1771	Seq. ID No. 1772
863	Seq. ID No. 1777	Seq. ID No. 1778
866b	Seq. ID No. 1785	Seq. ID No. 1786
868b	Seq. ID No. 1789	Seq. ID No. 1790
870	Seq. ID No. 1791	Seq. ID No. 1792
873c	Seq. ID No. 1797	Seq. ID No. 1798
874b	Seq. ID No. 1801	Seq. ID No. 1802

TABLE 18: GLIMMER™ ORFs

ORF Number	DNA SEQ ID Number	Protein SEQ ID Number
875	Seq. ID No. 1803	Seq. ID No. 1804
876	Seq. ID No. 1805	Seq. ID No. 1806
878c	Seq. ID No. 1811	Seq. ID No. 1812
880c	Seq. ID No. 1817	Seq. ID No. 1818
885	Seq. ID No. 1819	Seq. ID No. 1820
886	Seq. ID No. 1821	Seq. ID No. 1822
888	Seq. ID No. 1825	Seq. ID No. 1826
890b	Seq. ID No. 1829	Seq. ID No. 1830
907b	Seq. ID No. 1837	Seq. ID No. 1838
908c	Seq. ID No. 1843	Seq. ID No. 1844
911	Seq. ID No. 1845	Seq. ID No. 1846
912	Seq. ID No. 1847	Seq. ID No. 1848
916	Seq. ID No. 1849	Seq. ID No. 1850
917	Seq. ID No. 1851	Seq. ID No. 1852
918c	Seq. ID No. 1855	Seq. ID No. 1856
923	Seq. ID No. 1859	Seq. ID No. 1860
925b	Seq. ID No. 1863	Seq. ID No. 1864
926	Seq. ID No. 1865	Seq. ID No. 1866
927	Seq. ID No. 1867	Seq. ID No. 1868
929b	Seq. ID No. 1871	Seq. ID No. 1872
930	Seq. ID No. 1873	Seq. ID No. 1874
932	Seq. ID No. 1877	Seq. ID No. 1878
934d	Seq. ID No. 1885	Seq. ID No. 1886
935	Seq. ID No. 1887	Seq. ID No. 1888
938	Seq. ID No. 1889	Seq. ID No. 1890
939c	Seq. ID No. 1895	Seq. ID No. 1896
942	Seq. ID No. 1897	Seq. ID No. 1898
943	Seq. ID No. 1899	Seq. ID No. 1900
944b	Seq. ID No. 1903	Seq. ID No. 1904

TABLE 18: GLIMMER™ ORFs

ORF Number	DNA SEQ ID Number	Protein SEQ ID Number
946	Seq. ID No. 1905	Seq. ID No. 1906
949d	Seq. ID No. 1913	Seq. ID No. 1914
951b	Seq. ID No. 1919	Seq. ID No. 1920
952b	Seq. ID No. 1923	Seq. ID No. 1924
954	Seq. ID No. 1925	Seq. ID No. 1926
956	Seq. ID No. 1931	Seq. ID No. 1932
958b	Seq. ID No. 1935	Seq. ID No. 1936
959	Seq. ID No. 1937	Seq. ID No. 1938
961c	Seq. ID No. 1943	Seq. ID No. 1944
963	Seq. ID No. 1945	Seq. ID No. 1946
965b	Seq. ID No. 1949	Seq. ID No. 1950
966b	Seq. ID No. 1953	Seq. ID No. 1954
967b	Seq. ID No. 1957	Seq. ID No. 1958
968	Seq. ID No. 1959	Seq. ID No. 1960
969	Seq. ID No. 1961	Seq. ID No. 1962
972b	Seq. ID No. 1965	Seq. ID No. 1966
976	Seq. ID No. 1967	Seq. ID No. 1968
977b	Seq. ID No. 1971	Seq. ID No. 1972
978b	Seq. ID No. 1975	Seq. ID No. 1976
980	Seq. ID No. 1979	Seq. ID No. 1980
982	Seq. ID No. 1983	Seq. ID No. 1984
984b	Seq. ID No. 1987	Seq. ID No. 1988
986	Seq. ID No. 1989	Seq. ID No. 1990
987	Seq. ID No. 1991	Seq. ID No. 1992
988d	Seq. ID No. 1999	Seq. ID No. 2000
991	Seq. ID No. 2001	Seq. ID No. 2002
992	Seq. ID No. 2003	Seq. ID No. 2004
995	Seq. ID No. 2009	Seq. ID No. 2010
998b	Seq. ID No. 2015	Seq. ID No. 2016

TABLE 18: GLIMMER™ ORFS

ORF Number	DNA SEQ ID Number	Protein SEQ ID Number
999b	Seq. ID No. 2019	Seq. ID No. 2020
1000	Seq. ID No. 2021	Seq. ID No. 2022
1004b	Seq. ID No. 2031	Seq. ID No. 2032
1006b	Seq. ID No. 2035	Seq. ID No. 2036
1007	Seq. ID No. 2037	Seq. ID No. 2038
1013c	Seq. ID No. 2045	Seq. ID No. 2046
1016c	Seq. ID No. 2047	Seq. ID No. 2048
1017d	Seq. ID No. 2055	Seq. ID No. 2056
1018b	Seq. ID No. 2059	Seq. ID No. 2060
1021c	Seq. ID No. 2065	Seq. ID No. 2066
1024	Seq. ID No. 2067	Seq. ID No. 2068
1025	Seq. ID No. 2069	Seq. ID No. 2070
1026	Seq. ID No. 2071	Seq. ID No. 2072
1029	Seq. ID No. 2073	Seq. ID No. 2074
1033c	Seq. ID No. 2079	Seq. ID No. 2080
1036c	Seq. ID No. 2091	Seq. ID No. 2092
1037	Seq. ID No. 2093	Seq. ID No. 2094
1039b	Seq. ID No. 2097	Seq. ID No. 2098
1041	Seq. ID No. 2099	Seq. ID No. 2100
1042b	Seq. ID No. 2103	Seq. ID No. 2104
1047b	Seq. ID No. 2115	Seq. ID No. 2116
1049b	Seq. ID No. 2119	Seq. ID No. 2120
1050d	Seq. ID No. 2127	Seq. ID No. 2128
1057	Seq. ID No. 2135	Seq. ID No. 2136
1058	Seq. ID No. 2137	Seq. ID No. 2138
1060b	Seq. ID No. 2141	Seq. ID No. 2142
1062	Seq. ID No. 2143	Seq. ID No. 2144
1064	Seq. ID No. 2147	Seq. ID No. 2148
1065c	Seq. ID No. 2153	Seq. ID No. 2154

TABLE 18: GLIMMER™ ORFs

ORF Number	DNA SEQ ID Number	Protein SEQ ID Number
1067	Seq. ID No. 2159	Seq. ID No. 2160
1069	Seq. ID No. 2161	Seq. ID No. 2162
1070b	Seq. ID No. 2165	Seq. ID No. 2166
1076b	Seq. ID No. 2169	Seq. ID No. 2170
1077e	Seq. ID No. 2179	Seq. ID No. 2180
1079b	Seq. ID No. 2183	Seq. ID No. 2184
1080a	Seq. ID No. 2185	Seq. ID No. 2186
1081b	Seq. ID No. 2189	Seq. ID No. 2190
1082	Seq. ID No. 2191	Seq. ID No. 2192
1085	Seq. ID No. 2193	Seq. ID No. 2194
1086	Seq. ID No. 2195	Seq. ID No. 2196
1087b	Seq. ID No. 2199	Seq. ID No. 2200
1094b	Seq. ID No. 2207	Seq. ID No. 2208
1096c	Seq. ID No. 2217	Seq. ID No. 2218
1097	Seq. ID No. 2219	Seq. ID No. 2220
1098b	Seq. ID No. 2221	Seq. ID No. 2222
1100	Seq. ID No. 2223	Seq. ID No. 2224
1101b	Seq. ID No. 2227	Seq. ID No. 2228
1104	Seq. ID No. 2229	Seq. ID No. 2230
1106	Seq. ID No. 2231	Seq. ID No. 2232
1108a	Seq. ID No. 2233	Seq. ID No. 2234
1111c	Seq. ID No. 2241	Seq. ID No. 2242
1125	Seq. ID No. 2245	Seq. ID No. 2246
1126c	Seq. ID No. 2251	Seq. ID No. 2252
1127	Seq. ID No. 2253	Seq. ID No. 2254
1131	Seq. ID No. 2257	Seq. ID No. 2258
1132	Seq. ID No. 2259	Seq. ID No. 2260
1135b	Seq. ID No. 2263	Seq. ID No. 2264
1136b	Seq. ID No. 2267	Seq. ID No. 2268

TABLE 18: GLIMMER™ ORFS

ORF Number	DNA SEQ ID Number	Protein SEQ ID Number
1138	Seq. ID No. 2269	Seq. ID No. 2270
1140c	Seq. ID No. 2275	Seq. ID No. 2276
1142	Seq. ID No. 2281	Seq. ID No. 2282
1144c	Seq. ID No. 2287	Seq. ID No. 2288
1146e	Seq. ID No. 2297	Seq. ID No. 2298
1148	Seq. ID No. 2299	Seq. ID No. 2300
1149	Seq. ID No. 2301	Seq. ID No. 2302
1152g	Seq. ID No. 2315	Seq. ID No. 2316
1155g	Seq. ID No. 2329	Seq. ID No. 2330
1158b	Seq. ID No. 2333	Seq. ID No. 2334
1160	Seq. ID No. 2335	Seq. ID No. 2336
1161b	Seq. ID No. 2339	Seq. ID No. 2340
1165	Seq. ID No. 2343	Seq. ID No. 2344
1166	Seq. ID No. 2345	Seq. ID No. 2346
1167b	Seq. ID No. 2349	Seq. ID No. 2350
1168	Seq. ID No. 2351	Seq. ID No. 2352
1169c	Seq. ID No. 2357	Seq. ID No. 2358
1170	Seq. ID No. 2359	Seq. ID No. 2360
1171c	Seq. ID No. 2363	Seq. ID No. 2364
1172	Seq. ID No. 2365	Seq. ID No. 2366
1174	Seq. ID No. 2369	Seq. ID No. 2370
1177	Seq. ID No. 2373	Seq. ID No. 2374
1179c	Seq. ID No. 2381	Seq. ID No. 2382
1180e	Seq. ID No. 2391	Seq. ID No. 2392
1183b	Seq. ID No. 2399	Seq. ID No. 2400
1184	Seq. ID No. 2401	Seq. ID No. 2402
1185b	Seq. ID No. 2405	Seq. ID No. 2406
1186b	Seq. ID No. 2409	Seq. ID No. 2410
1188c	Seq. ID No. 2415	Seq. ID No. 2416

TABLE 18: GLIMMER™ ORFs

ORF Number	DNA SEQ ID Number	Protein SEQ ID Number
1191	Seq. ID No. 2417	Seq. ID No. 2418
1192b	Seq. ID No. 2421	Seq. ID No. 2422
1194	Seq. ID No. 2423	Seq. ID No. 2424
1196b	Seq. ID No. 2427	Seq. ID No. 2428
1197	Seq. ID No. 2429	Seq. ID No. 2430
1198	Seq. ID No. 2431	Seq. ID No. 2432
1199b	Seq. ID No. 2435	Seq. ID No. 2436
1200	Seq. ID No. 2437	Seq. ID No. 2438
1201	Seq. ID No. 2439	Seq. ID No. 2440
1202b	Seq. ID No. 2443	Seq. ID No. 2444
1205	Seq. ID No. 2445	Seq. ID No. 2446
1207	Seq. ID No. 2449	Seq. ID No. 2450
1208	Seq. ID No. 2451	Seq. ID No. 2452
1209	Seq. ID No. 2453	Seq. ID No. 2454
1210b	Seq. ID No. 2457	Seq. ID No. 2458
1213b	Seq. ID No. 2463	Seq. ID No. 2464
1214	Seq. ID No. 2465	Seq. ID No. 2466
1215b	Seq. ID No. 2469	Seq. ID No. 2470
1217c	Seq. ID No. 2471	Seq. ID No. 2472
1218b	Seq. ID No. 2475	Seq. ID No. 2476
1219	Seq. ID No. 2477	Seq. ID No. 2478
1221b	Seq. ID No. 2483	Seq. ID No. 2484
1223	Seq. ID No. 2485	Seq. ID No. 2486
1224c	Seq. ID No. 2491	Seq. ID No. 2492
1226	Seq. ID No. 2495	Seq. ID No. 2496
1230	Seq. ID No. 2505	Seq. ID No. 2506
1231	Seq. ID No. 2507	Seq. ID No. 2508
1233c	Seq. ID No. 2513	Seq. ID No. 2514
1234c	Seq. ID No. 2519	Seq. ID No. 2520

TABLE 18: GLIMMER™ ORFS

ORF Number	DNA SEQ ID Number	Protein SEQ ID Number
1237	Seq. ID No. 2525	Seq. ID No. 2526
1240	Seq. ID No. 2529	Seq. ID No. 2530
1241c	Seq. ID No. 2535	Seq. ID No. 2536
1243	Seq. ID No. 2537	Seq. ID No. 2538
1244	Seq. ID No. 2539	Seq. ID No. 2540
1245e	Seq. ID No. 2549	Seq. ID No. 2550
1246b	Seq. ID No. 2553	Seq. ID No. 2554
1250e	Seq. ID No. 2563	Seq. ID No. 2564
1251b	Seq. ID No. 2567	Seq. ID No. 2568
1253d	Seq. ID No. 2575	Seq. ID No. 2576
1256	Seq. ID No. 2577	Seq. ID No. 2578
1257b	Seq. ID No. 2581	Seq. ID No. 2582
1258d	Seq. ID No. 2589	Seq. ID No. 2590
1263	Seq. ID No. 2593	Seq. ID No. 2594
1265	Seq. ID No. 2595	Seq. ID No. 2596
1266b	Seq. ID No. 2599	Seq. ID No. 2600
1267b	Seq. ID No. 2603	Seq. ID No. 2604
1268b	Seq. ID No. 2607	Seq. ID No. 2608
1269	Seq. ID No. 2609	Seq. ID No. 2610
1271	Seq. ID No. 2613	Seq. ID No. 2614
1272b	Seq. ID No. 2617	Seq. ID No. 2618
1273	Seq. ID No. 2619	Seq. ID No. 2620
1275b	Seq. ID No. 2623	Seq. ID No. 2624
1277	Seq. ID No. 2625	Seq. ID No. 2626
1279	Seq. ID No. 2631	Seq. ID No. 2632
1281	Seq. ID No. 2633	Seq. ID No. 2634
1283c	Seq. ID No. 2639	Seq. ID No. 2640
1284	Seq. ID No. 2641	Seq. ID No. 2642
1285b	Seq. ID No. 2645	Seq. ID No. 2646

TABLE 18: GLIMMER™ ORFS

ORF Number	DNA SEQ ID Number	Protein SEQ ID Number
1287b	Seq. ID No. 2649	Seq. ID No. 2650
1288	Seq. ID No. 2651	Seq. ID No. 2652
1290	Seq. ID No. 2655	Seq. ID No. 2656
1293b	Seq. ID No. 2659	Seq. ID No. 2660
1295	Seq. ID No. 2663	Seq. ID No. 2664
1297b	Seq. ID No. 2667	Seq. ID No. 2668
1300	Seq. ID No. 2669	Seq. ID No. 2670
1302	Seq. ID No. 2671	Seq. ID No. 2672
1305c	Seq. ID No. 2677	Seq. ID No. 2678
1308e	Seq. ID No. 2687	Seq. ID No. 2688
1311	Seq. ID No. 2689	Seq. ID No. 2690
1315	Seq. ID No. 2693	Seq. ID No. 2694
1318	Seq. ID No. 2699	Seq. ID No. 2700
1319b	Seq. ID No. 2703	Seq. ID No. 2704
1320c	Seq. ID No. 2709	Seq. ID No. 2710
1321	Seq. ID No. 2711	Seq. ID No. 2712
1322b	Seq. ID No. 2715	Seq. ID No. 2716
1324	Seq. ID No. 2719	Seq. ID No. 2720
1326c	Seq. ID No. 2725	Seq. ID No. 2726
1333	Seq. ID No. 2727	Seq. ID No. 2728
1337	Seq. ID No. 2737	Seq. ID No. 2738
1340b	Seq. ID No. 2743	Seq. ID No. 2744
1341c	Seq. ID No. 2747	Seq. ID No. 2748
1344b	Seq. ID No. 2751	Seq. ID No. 2752
1348	Seq. ID No. 2753	Seq. ID No. 2754
1349c	Seq. ID No. 2759	Seq. ID No. 2760
1350b	Seq. ID No. 2763	Seq. ID No. 2764
1353	Seq. ID No. 2765	Seq. ID No. 2766
1355	Seq. ID No. 2767	Seq. ID No. 2768

TABLE 18: GLIMMER™ ORFS

ORF Number	DNA SEQ ID Number	Protein SEQ ID Number
1358b	Seq. ID No. 2771	Seq. ID No. 2772
1359	Seq. ID No. 2773	Seq. ID No. 2774
1361	Seq. ID No. 2775	Seq. ID No. 2776
1364c	Seq. ID No. 2781	Seq. ID No. 2782
1366b	Seq. ID No. 2787	Seq. ID No. 2788
1367	Seq. ID No. 2789	Seq. ID No. 2790
1368	Seq. ID No. 2791	Seq. ID No. 2792
1371	Seq. ID No. 2793	Seq. ID No. 2794
1373b	Seq. ID No. 2797	Seq. ID No. 2798
1374	Seq. ID No. 2799	Seq. ID No. 2800
1377	Seq. ID No. 2803	Seq. ID No. 2804
1378	Seq. ID No. 2805	Seq. ID No. 2806
1381a	Seq. ID No. 2811	Seq. ID No. 2812
1382	Seq. ID No. 2815	Seq. ID No. 2816
1384c	Seq. ID No. 2823	Seq. ID No. 2824
1386b	Seq. ID No. 2827	Seq. ID No. 2828
1394	Seq. ID No. 2843	Seq. ID No. 2844
1396	Seq. ID No. 2847	Seq. ID No. 2848
1405	Seq. ID No. 2863	Seq. ID No. 2864
1408	Seq. ID No. 2867	Seq. ID No. 2868
1409	Seq. ID No. 2869	Seq. ID No. 2870
1410	Seq. ID No. 2871	Seq. ID No. 2872
1411c	Seq. ID No. 2877	Seq. ID No. 2878
1412b	Seq. ID No. 2881	Seq. ID No. 2882
1416	Seq. ID No. 2891	Seq. ID No. 2892
1420b	Seq. ID No. 2899	Seq. ID No. 2900
1422	Seq. ID No. 2901	Seq. ID No. 2902
1423	Seq. ID No. 2903	Seq. ID No. 2904
1426b	Seq. ID No. 2907	Seq. ID No. 2908

TABLE 18: GLIMMER™ ORFS

ORF Number	DNA SEQ ID Number	Protein SEQ ID Number
1427b	Seq. ID No. 2911	Seq. ID No. 2912
1428	Seq. ID No. 2913	Seq. ID No. 2914
1429b	Seq. ID No. 2917	Seq. ID No. 2918
1431	Seq. ID No. 2919	Seq. ID No. 2920
1432	Seq. ID No. 2921	Seq. ID No. 2922
1433	Seq. ID No. 2923	Seq. ID No. 2924
1434b	Seq. ID No. 2927	Seq. ID No. 2928
1437c	Seq. ID No. 2933	Seq. ID No. 2934
1439e	Seq. ID No. 2945	Seq. ID No. 2946
1440d	Seq. ID No. 2953	Seq. ID No. 2954
1442b	Seq. ID No. 2957	Seq. ID No. 2958
1445c	Seq. ID No. 2963	Seq. ID No. 2964
1447b	Seq. ID No. 2971	Seq. ID No. 2972
1448	Seq. ID No. 2973	Seq. ID No. 2974
1449b	Seq. ID No. 2977	Seq. ID No. 2978
1451	Seq. ID No. 2979	Seq. ID No. 2980
1452b	Seq. ID No. 2983	Seq. ID No. 2984
1453	Seq. ID No. 2985	Seq. ID No. 2986
1455b	Seq. ID No. 2991	Seq. ID No. 2992
1456	Seq. ID No. 2993	Seq. ID No. 2994
1457c	Seq. ID No. 2999	Seq. ID No. 3000
1459	Seq. ID No. 3001	Seq. ID No. 3002
1462b	Seq. ID No. 3005	Seq. ID No. 3006
1463c	Seq. ID No. 3011	Seq. ID No. 3012
1466d	Seq. ID No. 3019	Seq. ID No. 3020
1469c	Seq. ID No. 3027	Seq. ID No. 3028
1470c	Seq. ID No. 3033	Seq. ID No. 3034
1471	Seq. ID No. 3035	Seq. ID No. 3036
1472c	Seq. ID No. 3039	Seq. ID No. 3040

TABLE 18: GLIMMER™ ORFs

ORF Number	DNA SEQ ID Number	Protein SEQ ID Number
1475	Seq. ID No. 3043	Seq. ID No. 3044
1476	Seq. ID No. 3045	Seq. ID No. 3046
1477b	Seq. ID No. 3049	Seq. ID No. 3050
1479c	Seq. ID No. 3055	Seq. ID No. 3056
1482b	Seq. ID No. 3059	Seq. ID No. 3060
1483	Seq. ID No. 3061	Seq. ID No. 3062
1484c	Seq. ID No. 3067	Seq. ID No. 3068
1486	Seq. ID No. 3069	Seq. ID No. 3070
1488e	Seq. ID No. 3081	Seq. ID No. 3082
1490	Seq. ID No. 3089	Seq. ID No. 3090
1494	Seq. ID No. 3091	Seq. ID No. 3092
1497	Seq. ID No. 3093	Seq. ID No. 3094
1498b	Seq. ID No. 3097	Seq. ID No. 3098
1499	Seq. ID No. 3103	Seq. ID No. 3104
1502b	Seq. ID No. 3107	Seq. ID No. 3108
1503b	Seq. ID No. 3111	Seq. ID No. 3112
1506c	Seq. ID No. 3117	Seq. ID No. 3118
1508	Seq. ID No. 3125	Seq. ID No. 3126
1510d	Seq. ID No. 3133	Seq. ID No. 3134
1511	Seq. ID No. 3135	Seq. ID No. 3136
1512	Seq. ID No. 3137	Seq. ID No. 3138
1513b	Seq. ID No. 3141	Seq. ID No. 3142
1516	Seq. ID No. 3143	Seq. ID No. 3144
1517c	Seq. ID No. 3149	Seq. ID No. 3150
1520	Seq. ID No. 3155	Seq. ID No. 3156
1522	Seq. ID No. 3157	Seq. ID No. 3158
1523	Seq. ID No. 3159	Seq. ID No. 3160
1528	Seq. ID No. 3161	Seq. ID No. 3162
1530b	Seq. ID No. 3165	Seq. ID No. 3166

TABLE 18: GLIMMER™ ORFS

ORF Number	DNA SEQ ID Number	Protein SEQ ID Number
1534b	Seq. ID No. 3171	Seq. ID No. 3172
1536b	Seq. ID No. 3177	Seq. ID No. 3178
1537	Seq. ID No. 3179	Seq. ID No. 3180
1543	Seq. ID No. 3183	Seq. ID No. 3184
1544	Seq. ID No. 3185	Seq. ID No. 3186
1547b	Seq. ID No. 3189	Seq. ID No. 3190
1548	Seq. ID No. 3191	Seq. ID No. 3192
1553b	Seq. ID No. 3197	Seq. ID No. 3198
1554c	Seq. ID No. 3203	Seq. ID No. 3204
1555	Seq. ID No. 3205	Seq. ID No. 3206
1556c	Seq. ID No. 3211	Seq. ID No. 3212
1557c	Seq. ID No. 3217	Seq. ID No. 3218
1559b	Seq. ID No. 3221	Seq. ID No. 3222
1564b	Seq. ID No. 3227	Seq. ID No. 3228
1565	Seq. ID No. 3229	Seq. ID No. 3230
1568b	Seq. ID No. 3233	Seq. ID No. 3234
1569	Seq. ID No. 3235	Seq. ID No. 3236
1571	Seq. ID No. 3239	Seq. ID No. 3240
1572e	Seq. ID No. 3249	Seq. ID No. 3250
1573	Seq. ID No. 3251	Seq. ID No. 3252
1576	Seq. ID No. 3253	Seq. ID No. 3254
1577b	Seq. ID No. 3257	Seq. ID No. 3258
1578	Seq. ID No. 3259	Seq. ID No. 3260
1580b	Seq. ID No. 3263	Seq. ID No. 3264
1581	Seq. ID No. 3265	Seq. ID No. 3266
1582c	Seq. ID No. 3271	Seq. ID No. 3272
1584	Seq. ID No. 3273	Seq. ID No. 3274
1585b	Seq. ID No. 3277	Seq. ID No. 3278
1587c	Seq. ID No. 3283	Seq. ID No. 3284

TABLE 18: GLIMMER™ ORFS

ORF Number	DNA SEQ ID Number	Protein SEQ ID Number
1588	Seq. ID No. 3285	Seq. ID No. 3286
1590	Seq. ID No. 3287	Seq. ID No. 3288
1591	Seq. ID No. 3289	Seq. ID No. 3290
1592b	Seq. ID No. 3293	Seq. ID No. 3294
1593	Seq. ID No. 3295	Seq. ID No. 3296
1594b	Seq. ID No. 3299	Seq. ID No. 3300
1595b	Seq. ID No. 3303	Seq. ID No. 3304
1598b	Seq. ID No. 3307	Seq. ID No. 3308
1600c	Seq. ID No. 3313	Seq. ID No. 3314
1602	Seq. ID No. 3315	Seq. ID No. 3316
1606b	Seq. ID No. 3319	Seq. ID No. 3320
1607b	Seq. ID No. 3323	Seq. ID No. 3324
1610b	Seq. ID No. 3329	Seq. ID No. 3330
1616b	Seq. ID No. 3335	Seq. ID No. 3336
1619	Seq. ID No. 3337	Seq. ID No. 3338
1623c	Seq. ID No. 3347	Seq. ID No. 3348
1625c	Seq. ID No. 3355	Seq. ID No. 3356
1626b	Seq. ID No. 3359	Seq. ID No. 3360
1628b	Seq. ID No. 3363	Seq. ID No. 3364
1632b	Seq. ID No. 3367	Seq. ID No. 3368
1634c	Seq. ID No. 3377	Seq. ID No. 3378
1639b	Seq. ID No. 3379	Seq. ID No. 3380
1642b	Seq. ID No. 3383	Seq. ID No. 3384
1643b	Seq. ID No. 3387	Seq. ID No. 3388
1646f	Seq. ID No. 3399	Seq. ID No. 3400
1647	Seq. ID No. 3401	Seq. ID No. 3402
1648b	Seq. ID No. 3403	Seq. ID No. 3404
1649c	Seq. ID No. 3409	Seq. ID No. 3410
1652b	Seq. ID No. 3413	Seq. ID No. 3414

TABLE 18: GLIMMER™ ORFs

ORF Number	DNA SEQ ID Number	Protein SEQ ID Number
1654	Seq. ID No. 3415	Seq. ID No. 3416
1656b	Seq. ID No. 3417	Seq. ID No. 3418
1659c	Seq. ID No. 3425	Seq. ID No. 3426
1660b	Seq. ID No. 3427	Seq. ID No. 3428
1662b	Seq. ID No. 3431	Seq. ID No. 3432
1664	Seq. ID No. 3435	Seq. ID No. 3436
1665a	Seq. ID No. 3437	Seq. ID No. 3438
1668	Seq. ID No. 3439	Seq. ID No. 3440
1670c	Seq. ID No. 3447	Seq. ID No. 3448
1673f	Seq. ID No. 3459	Seq. ID No. 3460
1674	Seq. ID No. 3461	Seq. ID No. 3462
1675c	Seq. ID No. 3467	Seq. ID No. 3468
1676	Seq. ID No. 3469	Seq. ID No. 3470
1677	Seq. ID No. 3471	Seq. ID No. 3472
1679	Seq. ID No. 3473	Seq. ID No. 3474
1680	Seq. ID No. 3475	Seq. ID No. 3476
1682b	Seq. ID No. 3479	Seq. ID No. 3480
1683b	Seq. ID No. 3483	Seq. ID No. 3484
1684	Seq. ID No. 3485	Seq. ID No. 3486
1685	Seq. ID No. 3487	Seq. ID No. 3488
1688c	Seq. ID No. 3495	Seq. ID No. 3496
1689c	Seq. ID No. 3501	Seq. ID No. 3502
1690b	Seq. ID No. 3505	Seq. ID No. 3506
1691	Seq. ID No. 3507	Seq. ID No. 3508
1692	Seq. ID No. 3509	Seq. ID No. 3510
1693	Seq. ID No. 3511	Seq. ID No. 3512
1694d	Seq. ID No. 3519	Seq. ID No. 3520
1696	Seq. ID No. 3521	Seq. ID No. 3522
1697b	Seq. ID No. 3525	Seq. ID No. 3526

TABLE 18: GLIMMER™ ORFs

ORF Number	DNA SEQ ID Number	Protein SEQ ID Number
1699b	Seq. ID No. 3529	Seq. ID No. 3530
1700b	Seq. ID No. 3533	Seq. ID No. 3534
1701b	Seq. ID No. 3537	Seq. ID No. 3538
1704b	Seq. ID No. 3543	Seq. ID No. 3544
1706	Seq. ID No. 3549	Seq. ID No. 3550
1707b	Seq. ID No. 3553	Seq. ID No. 3554
1710b	Seq. ID No. 3561	Seq. ID No. 3562
1712b	Seq. ID No. 3565	Seq. ID No. 3566
1715b	Seq. ID No. 3569	Seq. ID No. 3570
1722	Seq. ID No. 3575	Seq. ID No. 3576
1723b	Seq. ID No. 3579	Seq. ID No. 3580
1727	Seq. ID No. 3583	Seq. ID No. 3584
1728	Seq. ID No. 3585	Seq. ID No. 3586
1733	Seq. ID No. 3589	Seq. ID No. 3590
1737b	Seq. ID No. 3599	Seq. ID No. 3600
1738c	Seq. ID No. 3605	Seq. ID No. 3606
1739	Seq. ID No. 3607	Seq. ID No. 3608
1741	Seq. ID No. 3609	Seq. ID No. 3610
1743	Seq. ID No. 3611	Seq. ID No. 3612
1744b	Seq. ID No. 3615	Seq. ID No. 3616
1747	Seq. ID No. 3619	Seq. ID No. 3620
1752b	Seq. ID No. 3629	Seq. ID No. 3630
1756b	Seq. ID No. 3635	Seq. ID No. 3636
1757b	Seq. ID No. 3639	Seq. ID No. 3640
1759	Seq. ID No. 3641	Seq. ID No. 3642
1760	Seq. ID No. 3643	Seq. ID No. 3644
1762	Seq. ID No. 3645	Seq. ID No. 3646
1764c	Seq. ID No. 3651	Seq. ID No. 3652
1765	Seq. ID No. 3653	Seq. ID No. 3654

TABLE 18: GLIMMER™ ORFS

ORF Number	DNA SEQ ID Number	Protein SEQ ID Number
1767b	Seq. ID No. 3659	Seq. ID No. 3660
1769b	Seq. ID No. 3663	Seq. ID No. 3664
1771	Seq. ID No. 3665	Seq. ID No. 3666
1773	Seq. ID No. 3667	Seq. ID No. 3668
1774	Seq. ID No. 3669	Seq. ID No. 3670
1775c	Seq. ID No. 3675	Seq. ID No. 3676
1780	Seq. ID No. 3681	Seq. ID No. 3682
1784b	Seq. ID No. 3689	Seq. ID No. 3690
1788c	Seq. ID No. 3695	Seq. ID No. 3696
1789b	Seq. ID No. 3699	Seq. ID No. 3700
1792c	Seq. ID No. 3709	Seq. ID No. 3710
1793c	Seq. ID No. 3715	Seq. ID No. 3716
1797b	Seq. ID No. 3721	Seq. ID No. 3722
1798c	Seq. ID No. 3727	Seq. ID No. 3728
1800	Seq. ID No. 3729	Seq. ID No. 3730
1802b	Seq. ID No. 3733	Seq. ID No. 3734
1803	Seq. ID No. 3735	Seq. ID No. 3736
1804b	Seq. ID No. 3739	Seq. ID No. 3740
1805	Seq. ID No. 3741	Seq. ID No. 3742
1806c	Seq. ID No. 3747	Seq. ID No. 3748
1807b	Seq. ID No. 3751	Seq. ID No. 3752
1808d	Seq. ID No. 3759	Seq. ID No. 3760
1809f	Seq. ID No. 3771	Seq. ID No. 3772
1810b	Seq. ID No. 3775	Seq. ID No. 3776
1811b	Seq. ID No. 3779	Seq. ID No. 3780
1812b	Seq. ID No. 3783	Seq. ID No. 3784
1815c	Seq. ID No. 3791	Seq. ID No. 3792
1816c	Seq. ID No. 3797	Seq. ID No. 3798
1819b	Seq. ID No. 3803	Seq. ID No. 3804

TABLE 18: GLIMMER™ ORFS

ORF Number	DNA SEQ ID Number	Protein SEQ ID Number
1821	Seq. ID No. 3805	Seq. ID No. 3806
1823b	Seq. ID No. 3811	Seq. ID No. 3812
1825	Seq. ID No. 3813	Seq. ID No. 3814
1828	Seq. ID No. 3819	Seq. ID No. 3820
1830b	Seq. ID No. 3823	Seq. ID No. 3824
1833	Seq. ID No. 3825	Seq. ID No. 3826
1836b	Seq. ID No. 3833	Seq. ID No. 3834
1837	Seq. ID No. 3835	Seq. ID No. 3836
1838d	Seq. ID No. 3843	Seq. ID No. 3844
1839b	Seq. ID No. 3847	Seq. ID No. 3848
1842d	Seq. ID No. 3855	Seq. ID No. 3856
1843	Seq. ID No. 3857	Seq. ID No. 3858
1845c	Seq. ID No. 3863	Seq. ID No. 3864
1848b	Seq. ID No. 3867	Seq. ID No. 3868
1850c	Seq. ID No. 3873	Seq. ID No. 3874
1853b	Seq. ID No. 3877	Seq. ID No. 3878
1854b	Seq. ID No. 3881	Seq. ID No. 3882
1855	Seq. ID No. 3883	Seq. ID No. 3884
1856	Seq. ID No. 3885	Seq. ID No. 3886
1857d	Seq. ID No. 3893	Seq. ID No. 3894
1859	Seq. ID No. 3897	Seq. ID No. 3898
1861b	Seq. ID No. 3901	Seq. ID No. 3902
1863b	Seq. ID No. 3907	Seq. ID No. 3908
1865b	Seq. ID No. 3913	Seq. ID No. 3914
1868	Seq. ID No. 3915	Seq. ID No. 3916
1869	Seq. ID No. 3917	Seq. ID No. 3918
1870	Seq. ID No. 3919	Seq. ID No. 3920
1873c	Seq. ID No. 3925	Seq. ID No. 3926
1875c	Seq. ID No. 3929	Seq. ID No. 3930

TABLE 18: GLIMMER™ ORFs

ORF Number	DNA SEQ ID Number	Protein SEQ ID Number
1877b	Seq. ID No. 3933	Seq. ID No. 3934
1878	Seq. ID No. 3935	Seq. ID No. 3936
1879	Seq. ID No. 3937	Seq. ID No. 3938
1884	Seq. ID No. 3941	Seq. ID No. 3942
1886	Seq. ID No. 3943	Seq. ID No. 3944
1887	Seq. ID No. 3945	Seq. ID No. 3946
1888b	Seq. ID No. 3949	Seq. ID No. 3950
1890	Seq. ID No. 3951	Seq. ID No. 3952
1891b	Seq. ID No. 3955	Seq. ID No. 3956
1893	Seq. ID No. 3957	Seq. ID No. 3958
1897c	Seq. ID No. 3971	Seq. ID No. 3972
1898b	Seq. ID No. 3975	Seq. ID No. 3976
1902b	Seq. ID No. 3983	Seq. ID No. 3984
1907	Seq. ID No. 3985	Seq. ID No. 3986
1912	Seq. ID No. 3987	Seq. ID No. 3988
1915b	Seq. ID No. 3991	Seq. ID No. 3992
1918d	Seq. ID No. 4003	Seq. ID No. 4004
1919c	Seq. ID No. 4009	Seq. ID No. 4010
1923b	Seq. ID No. 4013	Seq. ID No. 4014
1925	Seq. ID No. 4015	Seq. ID No. 4016
1926	Seq. ID No. 4017	Seq. ID No. 4018
1927b	Seq. ID No. 4021	Seq. ID No. 4022
1930	Seq. ID No. 4023	Seq. ID No. 4024
1931c	Seq. ID No. 4029	Seq. ID No. 4030
1932	Seq. ID No. 4031	Seq. ID No. 4032
1933b	Seq. ID No. 4035	Seq. ID No. 4036
1934	Seq. ID No. 4037	Seq. ID No. 4038
1936	Seq. ID No. 4039	Seq. ID No. 4040
1937e	Seq. ID No. 4049	Seq. ID No. 4050

TABLE 18: GLIMMER™ ORFs

ORF Number	DNA SEQ ID Number	Protein SEQ ID Number
1939c	Seq. ID No. 4055	Seq. ID No. 4056
1940	Seq. ID No. 4057	Seq. ID No. 4058
1941b	Seq. ID No. 4061	Seq. ID No. 4062
1942	Seq. ID No. 4063	Seq. ID No. 4064
1943b	Seq. ID No. 4067	Seq. ID No. 4068
1944	Seq. ID No. 4069	Seq. ID No. 4070
1946c	Seq. ID No. 4075	Seq. ID No. 4076
1949	Seq. ID No. 4077	Seq. ID No. 4078
1950	Seq. ID No. 4079	Seq. ID No. 4080
1951d	Seq. ID No. 4087	Seq. ID No. 4088
1953	Seq. ID No. 4089	Seq. ID No. 4090
1954c	Seq. ID No. 4095	Seq. ID No. 4096
1956	Seq. ID No. 4097	Seq. ID No. 4098
1957	Seq. ID No. 4099	Seq. ID No. 4100
1958c	Seq. ID No. 4105	Seq. ID No. 4106
1960c	Seq. ID No. 4111	Seq. ID No. 4112
1962b	Seq. ID No. 4117	Seq. ID No. 4118
1965b	Seq. ID No. 4121	Seq. ID No. 4122
1966	Seq. ID No. 4123	Seq. ID No. 4124
1968	Seq. ID No. 4127	Seq. ID No. 4128
1969	Seq. ID No. 4129	Seq. ID No. 4130
1970b	Seq. ID No. 4133	Seq. ID No. 4134
1973	Seq. ID No. 4137	Seq. ID No. 4138
1977c	Seq. ID No. 4145	Seq. ID No. 4146
1979b	Seq. ID No. 4149	Seq. ID No. 4150
1982	Seq. ID No. 4157	Seq. ID No. 4158
1985b	Seq. ID No. 4161	Seq. ID No. 4162
1986	Seq. ID No. 4163	Seq. ID No. 4164
1987b	Seq. ID No. 4167	Seq. ID No. 4168

TABLE 18: GLIMMER™ ORFs

ORF Number	DNA SEQ ID Number	Protein SEQ ID Number
1989c	Seq. ID No. 4173	Seq. ID No. 4174
1990c	Seq. ID No. 4179	Seq. ID No. 4180
1992b	Seq. ID No. 4185	Seq. ID No. 4186
1993c	Seq. ID No. 4191	Seq. ID No. 4192
1996	Seq. ID No. 4193	Seq. ID No. 4194
2000	Seq. ID No. 4195	Seq. ID No. 4196
2001	Seq. ID No. 4197	Seq. ID No. 4198
2003	Seq. ID No. 4199	Seq. ID No. 4200
2006	Seq. ID No. 4201	Seq. ID No. 4202
2008	Seq. ID No. 4203	Seq. ID No. 4204
2010	Seq. ID No. 4205	Seq. ID No. 4206
2011c	Seq. ID No. 4211	Seq. ID No. 4212
2013b	Seq. ID No. 4215	Seq. ID No. 4216
2014c	Seq. ID No. 4217	Seq. ID No. 4218
2015	Seq. ID No. 4219	Seq. ID No. 4220
2016h	Seq. ID No. 4235	Seq. ID No. 4236
2020	Seq. ID No. 4237	Seq. ID No. 4238
2021	Seq. ID No. 4239	Seq. ID No. 4240
2023b	Seq. ID No. 4243	Seq. ID No. 4244
2024d	Seq. ID No. 4251	Seq. ID No. 4252
2027	Seq. ID No. 4255	Seq. ID No. 4256
2030d	Seq. ID No. 4263	Seq. ID No. 4264
2033	Seq. ID No. 4267	Seq. ID No. 4268
2036	Seq. ID No. 4271	Seq. ID No. 4272
2037	Seq. ID No. 4273	Seq. ID No. 4274
2042	Seq. ID No. 4279	Seq. ID No. 4280
2043b	Seq. ID No. 4281	Seq. ID No. 4282
2044	Seq. ID No. 4283	Seq. ID No. 4284
2046b	Seq. ID No. 4291	Seq. ID No. 4292

TABLE 18: GLIMMER™ ORFs

ORF Number	DNA SEQ ID Number	Protein SEQ ID Number
2047b	Seq. ID No. 4295	Seq. ID No. 4296
2050	Seq. ID No. 4299	Seq. ID No. 4300
2053	Seq. ID No. 4301	Seq. ID No. 4302
2054	Seq. ID No. 4303	Seq. ID No. 4304
2056	Seq. ID No. 4307	Seq. ID No. 4308
2057	Seq. ID No. 4309	Seq. ID No. 4310
2059b	Seq. ID No. 4313	Seq. ID No. 4314
2060b	Seq. ID No. 4317	Seq. ID No. 4318
2062c	Seq. ID No. 4323	Seq. ID No. 4324
2064	Seq. ID No. 4325	Seq. ID No. 4326
2065b	Seq. ID No. 4329	Seq. ID No. 4330
2066	Seq. ID No. 4331	Seq. ID No. 4332
2068	Seq. ID No. 4333	Seq. ID No. 4334
2069c	Seq. ID No. 4339	Seq. ID No. 4340
2074b	Seq. ID No. 4343	Seq. ID No. 4344
2075b	Seq. ID No. 4347	Seq. ID No. 4348
2076c	Seq. ID No. 4353	Seq. ID No. 4354
2078	Seq. ID No. 4355	Seq. ID No. 4356
2079a	Seq. ID No. 4357	Seq. ID No. 4358
2081b	Seq. ID No. 4365	Seq. ID No. 4366
2086b	Seq. ID No. 4369	Seq. ID No. 4370
2087b	Seq. ID No. 4373	Seq. ID No. 4374
2088	Seq. ID No. 4375	Seq. ID No. 4376
2091	Seq. ID No. 4377	Seq. ID No. 4378
2092	Seq. ID No. 4379	Seq. ID No. 4380
2093a	Seq. ID No. 4381	Seq. ID No. 4382
2094	Seq. ID No. 4383	Seq. ID No. 4384
2096d	Seq. ID No. 4391	Seq. ID No. 4392
2097	Seq. ID No. 4393	Seq. ID No. 4394

TABLE 18: GLIMMER™ ORFS

ORF Number	DNA SEQ ID Number	Protein SEQ ID Number
2100	Seq. ID No. 4397	Seq. ID No. 4398
2104	Seq. ID No. 4401	Seq. ID No. 4402
2109b	Seq. ID No. 4411	Seq. ID No. 4412
2110c	Seq. ID No. 4417	Seq. ID No. 4418
2112c	Seq. ID No. 4423	Seq. ID No. 4424
2115c	Seq. ID No. 4431	Seq. ID No. 4432
2116	Seq. ID No. 4433	Seq. ID No. 4434
2117	Seq. ID No. 4435	Seq. ID No. 4436
2123	Seq. ID No. 4443	Seq. ID No. 4444
2124b	Seq. ID No. 4447	Seq. ID No. 4448
2125b	Seq. ID No. 4451	Seq. ID No. 4452
2128b	Seq. ID No. 4459	Seq. ID No. 4460
2133	Seq. ID No. 4461	Seq. ID No. 4462
2138c	Seq. ID No. 4467	Seq. ID No. 4468
2140b	Seq. ID No. 4471	Seq. ID No. 4472
2142b	Seq. ID No. 4475	Seq. ID No. 4476
2144b	Seq. ID No. 4479	Seq. ID No. 4480
2146	Seq. ID No. 4481	Seq. ID No. 4482
2147c	Seq. ID No. 4487	Seq. ID No. 4488
2149b	Seq. ID No. 4491	Seq. ID No. 4492
2153	Seq. ID No. 4501	Seq. ID No. 4502
2155b	Seq. ID No. 4505	Seq. ID No. 4506
2156c	Seq. ID No. 4511	Seq. ID No. 4512
2160d	Seq. ID No. 4523	Seq. ID No. 4524
2164	Seq. ID No. 4531	Seq. ID No. 4532
2165	Seq. ID No. 4533	Seq. ID No. 4534
2166b	Seq. ID No. 4537	Seq. ID No. 4538
2169	Seq. ID No. 4539	Seq. ID No. 4540
2171	Seq. ID No. 4541	Seq. ID No. 4542

TABLE 18: GLIMMER™ ORFS

ORF Number	DNA SEQ ID Number	Protein SEQ ID Number
2172	Seq. ID No. 4543	Seq. ID No. 4544
2173b	Seq. ID No. 4547	Seq. ID No. 4548
2174	Seq. ID No. 4549	Seq. ID No. 4550
2176d	Seq. ID No. 4559	Seq. ID No. 4560
2179b	Seq. ID No. 4565	Seq. ID No. 4566
2180	Seq. ID No. 4567	Seq. ID No. 4568
2181b	Seq. ID No. 4571	Seq. ID No. 4572
2183	Seq. ID No. 4575	Seq. ID No. 4576
2185	Seq. ID No. 4577	Seq. ID No. 4578
2186b	Seq. ID No. 4581	Seq. ID No. 4582
2189b	Seq. ID No. 4585	Seq. ID No. 4586
2193	Seq. ID No. 4591	Seq. ID No. 4592
2194c	Seq. ID No. 4595	Seq. ID No. 4596
2196	Seq. ID No. 4597	Seq. ID No. 4598
2197c	Seq. ID No. 4603	Seq. ID No. 4604
2201b	Seq. ID No. 4607	Seq. ID No. 4608
2203	Seq. ID No. 4609	Seq. ID No. 4610
2204	Seq. ID No. 4611	Seq. ID No. 4612
2206b	Seq. ID No. 4615	Seq. ID No. 4616
2209	Seq. ID No. 4623	Seq. ID No. 4624
2212b	Seq. ID No. 4627	Seq. ID No. 4628
2215b	Seq. ID No. 4631	Seq. ID No. 4632
2216b	Seq. ID No. 4635	Seq. ID No. 4636
2218	Seq. ID No. 4637	Seq. ID No. 4638
2219c	Seq. ID No. 4643	Seq. ID No. 4644
2220c	Seq. ID No. 4649	Seq. ID No. 4650
2221	Seq. ID No. 4651	Seq. ID No. 4652
2222	Seq. ID No. 4653	Seq. ID No. 4654
2223b	Seq. ID No. 4657	Seq. ID No. 4658

TABLE 18: GLIMMER™ ORFS

ORF Number	DNA SEQ ID Number	Protein SEQ ID Number
2226	Seq. ID No. 4661	Seq. ID No. 4662
2227	Seq. ID No. 4663	Seq. ID No. 4664
2228c	Seq. ID No. 4669	Seq. ID No. 4670
2231	Seq. ID No. 4671	Seq. ID No. 4672
2232	Seq. ID No. 4673	Seq. ID No. 4674
2234c	Seq. ID No. 4679	Seq. ID No. 4680
2238	Seq. ID No. 4685	Seq. ID No. 4686
2240c	Seq. ID No. 4693	Seq. ID No. 4694
2244	Seq. ID No. 4697	Seq. ID No. 4698
2248	Seq. ID No. 4703	Seq. ID No. 4704
2249	Seq. ID No. 4705	Seq. ID No. 4706
2253d	Seq. ID No. 4713	Seq. ID No. 4714
2255b	Seq. ID No. 4717	Seq. ID No. 4718
2256	Seq. ID No. 4719	Seq. ID No. 4720
2259b	Seq. ID No. 4725	Seq. ID No. 4726
2260c	Seq. ID No. 4729	Seq. ID No. 4730
2262	Seq. ID No. 4731	Seq. ID No. 4732
2263	Seq. ID No. 4733	Seq. ID No. 4734
2267	Seq. ID No. 4739	Seq. ID No. 4740
2269	Seq. ID No. 4743	Seq. ID No. 4744
2270	Seq. ID No. 4745	Seq. ID No. 4746
2272	Seq. ID No. 4747	Seq. ID No. 4748
2273	Seq. ID No. 4749	Seq. ID No. 4750
2274	Seq. ID No. 4751	Seq. ID No. 4752
2275c	Seq. ID No. 4757	Seq. ID No. 4758
2276d	Seq. ID No. 4765	Seq. ID No. 4766
2277b	Seq. ID No. 4769	Seq. ID No. 4770
2278d	Seq. ID No. 4777	Seq. ID No. 4778
2280	Seq. ID No. 4779	Seq. ID No. 4780

TABLE 18: GLIMMER™ ORFs

ORF Number	DNA SEQ ID Number	Protein SEQ ID Number
2284	Seq. ID No. 4781	Seq. ID No. 4782
2286b	Seq. ID No. 4787	Seq. ID No. 4788
2288	Seq. ID No. 4789	Seq. ID No. 4790
2290	Seq. ID No. 4791	Seq. ID No. 4792
2291c	Seq. ID No. 4797	Seq. ID No. 4798
2292c	Seq. ID No. 4803	Seq. ID No. 4804
2297	Seq. ID No. 4807	Seq. ID No. 4808
2298	Seq. ID No. 4809	Seq. ID No. 4810
2299	Seq. ID No. 4811	Seq. ID No. 4812
2300	Seq. ID No. 4813	Seq. ID No. 4814
2301	Seq. ID No. 4815	Seq. ID No. 4816
2304	Seq. ID No. 4821	Seq. ID No. 4822
2306c	Seq. ID No. 4823	Seq. ID No. 4824
2307	Seq. ID No. 4825	Seq. ID No. 4826
2308	Seq. ID No. 4827	Seq. ID No. 4828
2309c	Seq. ID No. 4833	Seq. ID No. 4834
2310	Seq. ID No. 4835	Seq. ID No. 4836
2311	Seq. ID No. 4837	Seq. ID No. 4838
2312c	Seq. ID No. 4843	Seq. ID No. 4844
2314	Seq. ID No. 4845	Seq. ID No. 4846
2315	Seq. ID No. 4847	Seq. ID No. 4848
2316	Seq. ID No. 4849	Seq. ID No. 4850
2321c	Seq. ID No. 4859	Seq. ID No. 4860
2322	Seq. ID No. 4861	Seq. ID No. 4862
2327	Seq. ID No. 4865	Seq. ID No. 4866
2328	Seq. ID No. 4867	Seq. ID No. 4868
2329d	Seq. ID No. 4875	Seq. ID No. 4876
2330	Seq. ID No. 4877	Seq. ID No. 4878
2331	Seq. ID No. 4879	Seq. ID No. 4880

TABLE 18: GLIMMER™ ORFS

ORF Number	DNA SEQ ID Number	Protein SEQ ID Number
2333	Seq. ID No. 4881	Seq. ID No. 4882
2335	Seq. ID No. 4883	Seq. ID No. 4884
2336	Seq. ID No. 4885	Seq. ID No. 4886
2337b	Seq. ID No. 4887	Seq. ID No. 4888
2338c	Seq. ID No. 4893	Seq. ID No. 4894
2342c	Seq. ID No. 4899	Seq. ID No. 4900
2344	Seq. ID No. 4901	Seq. ID No. 4902
2345	Seq. ID No. 4903	Seq. ID No. 4904
2347	Seq. ID No. 4905	Seq. ID No. 4906
2348	Seq. ID No. 4907	Seq. ID No. 4908
2349b	Seq. ID No. 4911	Seq. ID No. 4912
2353	Seq. ID No. 4915	Seq. ID No. 4916
2354	Seq. ID No. 4917	Seq. ID No. 4918
2357	Seq. ID No. 4919	Seq. ID No. 4920
2358	Seq. ID No. 4921	Seq. ID No. 4922
2361b	Seq. ID No. 4927	Seq. ID No. 4928
2363b	Seq. ID No. 4931	Seq. ID No. 4932
2365b	Seq. ID No. 4935	Seq. ID No. 4936
2366b	Seq. ID No. 4939	Seq. ID No. 4940
2367	Seq. ID No. 4941	Seq. ID No. 4942
2368	Seq. ID No. 4943	Seq. ID No. 4944
2369	Seq. ID No. 4945	Seq. ID No. 4946
2370	Seq. ID No. 4947	Seq. ID No. 4948
2373	Seq. ID No. 4953	Seq. ID No. 4954
2374b	Seq. ID No. 4957	Seq. ID No. 4958
2376	Seq. ID No. 4959	Seq. ID No. 4960
2377b	Seq. ID No. 4963	Seq. ID No. 4964
2378	Seq. ID No. 4965	Seq. ID No. 4966
2379b	Seq. ID No. 4969	Seq. ID No. 4970

TABLE 18: GLIMMER™ ORFS

ORF Number	DNA SEQ ID Number	Protein SEQ ID Number
2380	Seq. ID No. 4971	Seq. ID No. 4972
2381	Seq. ID No. 4973	Seq. ID No. 4974
2384b	Seq. ID No. 4979	Seq. ID No. 4980
2387	Seq. ID No. 4985	Seq. ID No. 4986
2391	Seq. ID No. 4989	Seq. ID No. 4990
2392	Seq. ID No. 4991	Seq. ID No. 4992
2395	Seq. ID No. 4995	Seq. ID No. 4996
2396	Seq. ID No. 4997	Seq. ID No. 4998
2398	Seq. ID No. 5001	Seq. ID No. 5002
2399c	Seq. ID No. 5007	Seq. ID No. 5008
2401	Seq. ID No. 5009	Seq. ID No. 5010
2403b	Seq. ID No. 5017	Seq. ID No. 5018
2404b	Seq. ID No. 5021	Seq. ID No. 5022
2409b	Seq. ID No. 5027	Seq. ID No. 5028
2410	Seq. ID No. 5029	Seq. ID No. 5030
2415b	Seq. ID No. 5039	Seq. ID No. 5040
2417b	Seq. ID No. 5047	Seq. ID No. 5048
2418b	Seq. ID No. 5051	Seq. ID No. 5052
2420	Seq. ID No. 5053	Seq. ID No. 5054
2421	Seq. ID No. 5055	Seq. ID No. 5056
2422c	Seq. ID No. 5059	Seq. ID No. 5060
2423a	Seq. ID No. 5061	Seq. ID No. 5062
2424c	Seq. ID No. 5069	Seq. ID No. 5070
2428c	Seq. ID No. 5077	Seq. ID No. 5078
2429	Seq. ID No. 5079	Seq. ID No. 5080
2432	Seq. ID No. 5081	Seq. ID No. 5082
2433	Seq. ID No. 5083	Seq. ID No. 5084
2440	Seq. ID No. 5087	Seq. ID No. 5088
2442b	Seq. ID No. 5091	Seq. ID No. 5092

TABLE 18: GLIMMER™ ORFS

ORF Number	DNA SEQ ID Number	Protein SEQ ID Number
2443	Seq. ID No. 5093	Seq. ID No. 5094
2444b	Seq. ID No. 5097	Seq. ID No. 5098
2445	Seq. ID No. 5103	Seq. ID No. 5104
2448b	Seq. ID No. 5105	Seq. ID No. 5106
2449b	Seq. ID No. 5109	Seq. ID No. 5110
2451	Seq. ID No. 5111	Seq. ID No. 5112
2452	Seq. ID No. 5113	Seq. ID No. 5114
2453	Seq. ID No. 5115	Seq. ID No. 5116
2455	Seq. ID No. 5117	Seq. ID No. 5118
2456e	Seq. ID No. 5127	Seq. ID No. 5128
2458g	Seq. ID No. 5141	Seq. ID No. 5142
2461b	Seq. ID No. 5145	Seq. ID No. 5146
2462b	Seq. ID No. 5149	Seq. ID No. 5150
2464	Seq. ID No. 5153	Seq. ID No. 5154
2465b	Seq. ID No. 5157	Seq. ID No. 5158
2469b	Seq. ID No. 5165	Seq. ID No. 5166
2471	Seq. ID No. 5169	Seq. ID No. 5170
2473	Seq. ID No. 5171	Seq. ID No. 5172
2474c	Seq. ID No. 5177	Seq. ID No. 5178
2475c	Seq. ID No. 5183	Seq. ID No. 5184
2477	Seq. ID No. 5185	Seq. ID No. 5186
2480	Seq. ID No. 5187	Seq. ID No. 5188
2482	Seq. ID No. 5193	Seq. ID No. 5194
2483	Seq. ID No. 5195	Seq. ID No. 5196
2485	Seq. ID No. 5201	Seq. ID No. 5202
2489	Seq. ID No. 5203	Seq. ID No. 5204
2490	Seq. ID No. 5205	Seq. ID No. 5206
2492b	Seq. ID No. 5209	Seq. ID No. 5210
2494	Seq. ID No. 5211	Seq. ID No. 5212

TABLE 18: GLIMMER™ ORFs

ORF Number	DNA SEQ ID Number	Protein SEQ ID Number
2495b	Seq. ID No. 5215	Seq. ID No. 5216
2497b	Seq. ID No. 5219	Seq. ID No. 5220
2500c	Seq. ID No. 5227	Seq. ID No. 5228
2501b	Seq. ID No. 5231	Seq. ID No. 5232
2504b	Seq. ID No. 5235	Seq. ID No. 5236
2505	Seq. ID No. 5237	Seq. ID No. 5238
2506	Seq. ID No. 5239	Seq. ID No. 5240
2507c	Seq. ID No. 5243	Seq. ID No. 5244
2510	Seq. ID No. 5245	Seq. ID No. 5246
2512c	Seq. ID No. 5247	Seq. ID No. 5248
2513c	Seq. ID No. 5253	Seq. ID No. 5254
2514	Seq. ID No. 5255	Seq. ID No. 5256
2515	Seq. ID No. 5257	Seq. ID No. 5258
2516b	Seq. ID No. 5261	Seq. ID No. 5262
2517a	Seq. ID No. 5263	Seq. ID No. 5264
2519b	Seq. ID No. 5271	Seq. ID No. 5272
2520b	Seq. ID No. 5275	Seq. ID No. 5276
2523	Seq. ID No. 5283	Seq. ID No. 5284
2527b	Seq. ID No. 5291	Seq. ID No. 5292
2528d	Seq. ID No. 5299	Seq. ID No. 5300
2534	Seq. ID No. 5305	Seq. ID No. 5306
2535b	Seq. ID No. 5309	Seq. ID No. 5310
2538	Seq. ID No. 5311	Seq. ID No. 5312
2541	Seq. ID No. 5313	Seq. ID No. 5314
2542c	Seq. ID No. 5319	Seq. ID No. 5320
2544	Seq. ID No. 5323	Seq. ID No. 5324
2545	Seq. ID No. 5325	Seq. ID No. 5326
2548b	Seq. ID No. 5335	Seq. ID No. 5336
2549	Seq. ID No. 5337	Seq. ID No. 5338

TABLE 18: GLIMMER™ ORFs

ORF Number	DNA SEQ ID Number	Protein SEQ ID Number
2550c	Seq. ID No. 5341	Seq. ID No. 5342
2552	Seq. ID No. 5345	Seq. ID No. 5346
2554b	Seq. ID No. 5351	Seq. ID No. 5352
2555b	Seq. ID No. 5355	Seq. ID No. 5356
2558b	Seq. ID No. 5363	Seq. ID No. 5364
2559	Seq. ID No. 5365	Seq. ID No. 5366
2561	Seq. ID No. 5367	Seq. ID No. 5368
2562c	Seq. ID No. 5371	Seq. ID No. 5372
2563	Seq. ID No. 5373	Seq. ID No. 5374
2564d	Seq. ID No. 5381	Seq. ID No. 5382
2566	Seq. ID No. 5383	Seq. ID No. 5384
2567b	Seq. ID No. 5387	Seq. ID No. 5388
2568	Seq. ID No. 5389	Seq. ID No. 5390
2572	Seq. ID No. 5391	Seq. ID No. 5392
2573	Seq. ID No. 5393	Seq. ID No. 5394
2575	Seq. ID No. 5395	Seq. ID No. 5396
2576	Seq. ID No. 5397	Seq. ID No. 5398
2578	Seq. ID No. 5399	Seq. ID No. 5400
2579b	Seq. ID No. 5401	Seq. ID No. 5402
2581	Seq. ID No. 5403	Seq. ID No. 5404
2582c	Seq. ID No. 5409	Seq. ID No. 5410
2585	Seq. ID No. 5411	Seq. ID No. 5412
2587b	Seq. ID No. 5415	Seq. ID No. 5416
2588	Seq. ID No. 5417	Seq. ID No. 5418
2589	Seq. ID No. 5419	Seq. ID No. 5420
2591	Seq. ID No. 5421	Seq. ID No. 5422
2592	Seq. ID No. 5423	Seq. ID No. 5424
2593b	Seq. ID No. 5427	Seq. ID No. 5428
2594b	Seq. ID No. 5431	Seq. ID No. 5432

TABLE 18: GLIMMER™ ORFS

ORF Number	DNA SEQ ID Number	Protein SEQ ID Number
2596	Seq. ID No. 5433	Seq. ID No. 5434
2597c	Seq. ID No. 5439	Seq. ID No. 5440
2598	Seq. ID No. 5441	Seq. ID No. 5442
2602	Seq. ID No. 5443	Seq. ID No. 5444
2605b	Seq. ID No. 5447	Seq. ID No. 5448
2606	Seq. ID No. 5449	Seq. ID No. 5450
2608	Seq. ID No. 5451	Seq. ID No. 5452
2610	Seq. ID No. 5453	Seq. ID No. 5454
2611	Seq. ID No. 5455	Seq. ID No. 5456
2613	Seq. ID No. 5457	Seq. ID No. 5458
2616h	Seq. ID No. 5473	Seq. ID No. 5474
2617b	Seq. ID No. 5477	Seq. ID No. 5478
2619	Seq. ID No. 5483	Seq. ID No. 5484
2621a	Seq. ID No. 5487	Seq. ID No. 5488
2623b	Seq. ID No. 5491	Seq. ID No. 5492
2624b	Seq. ID No. 5495	Seq. ID No. 5496
2625b	Seq. ID No. 5499	Seq. ID No. 5500
2626b	Seq. ID No. 5503	Seq. ID No. 5504
2627b	Seq. ID No. 5507	Seq. ID No. 5508
2628	Seq. ID No. 5509	Seq. ID No. 5510
2629b	Seq. ID No. 5513	Seq. ID No. 5514
2633e	Seq. ID No. 5527	Seq. ID No. 5528
2637b	Seq. ID No. 5531	Seq. ID No. 5532
2643b	Seq. ID No. 5537	Seq. ID No. 5538
2645	Seq. ID No. 5539	Seq. ID No. 5540
2647	Seq. ID No. 5541	Seq. ID No. 5542
2649	Seq. ID No. 5547	Seq. ID No. 5548
2652b	Seq. ID No. 5553	Seq. ID No. 5554
2655b	Seq. ID No. 5557	Seq. ID No. 5558

TABLE 18: GLIMMER™ ORFS

ORF Number	DNA SEQ ID Number	Protein SEQ ID Number
2656	Seq. ID No. 5559	Seq. ID No. 5560
2658b	Seq. ID No. 5563	Seq. ID No. 5564
2659b	Seq. ID No. 5567	Seq. ID No. 5568
2662	Seq. ID No. 5571	Seq. ID No. 5572
2664b	Seq. ID No. 5575	Seq. ID No. 5576
2666b	Seq. ID No. 5581	Seq. ID No. 5582
2667b	Seq. ID No. 5585	Seq. ID No. 5586
2669c	Seq. ID No. 5591	Seq. ID No. 5592
2674b	Seq. ID No. 5599	Seq. ID No. 5600
2676	Seq. ID No. 5601	Seq. ID No. 5602
2677b	Seq. ID No. 5605	Seq. ID No. 5606
2679d	Seq. ID No. 5615	Seq. ID No. 5616
2680c	Seq. ID No. 5621	Seq. ID No. 5622
2684b	Seq. ID No. 5629	Seq. ID No. 5630
2686	Seq. ID No. 5631	Seq. ID No. 5632
2688c	Seq. ID No. 5637	Seq. ID No. 5638
2690c	Seq. ID No. 5647	Seq. ID No. 5648
2693	Seq. ID No. 5651	Seq. ID No. 5652
2694b	Seq. ID No. 5655	Seq. ID No. 5656
2695	Seq. ID No. 5657	Seq. ID No. 5658
2696b	Seq. ID No. 5661	Seq. ID No. 5662
2709	Seq. ID No. 5665	Seq. ID No. 5666
2712	Seq. ID No. 5669	Seq. ID No. 5670
2713	Seq. ID No. 5671	Seq. ID No. 5672
2714	Seq. ID No. 5673	Seq. ID No. 5674
2716c	Seq. ID No. 5679	Seq. ID No. 5680
2718c	Seq. ID No. 5685	Seq. ID No. 5686
2721b	Seq. ID No. 5693	Seq. ID No. 5694
2722b	Seq. ID No. 5697	Seq. ID No. 5698

TABLE 18: GLIMMER™ ORFS

ORF Number	DNA SEQ ID Number	Protein SEQ ID Number
2723	Seq. ID No. 5699	Seq. ID No. 5700
2724	Seq. ID No. 5701	Seq. ID No. 5702
2726	Seq. ID No. 5707	Seq. ID No. 5708
2731b	Seq. ID No. 5715	Seq. ID No. 5716
2732	Seq. ID No. 5717	Seq. ID No. 5718
2734c	Seq. ID No. 5723	Seq. ID No. 5724
2735b	Seq. ID No. 5727	Seq. ID No. 5728
2738d	Seq. ID No. 5735	Seq. ID No. 5736
2742b	Seq. ID No. 5739	Seq. ID No. 5740
2745b	Seq. ID No. 5749	Seq. ID No. 5750
2746	Seq. ID No. 5751	Seq. ID No. 5752
2747b	Seq. ID No. 5755	Seq. ID No. 5756
2748c	Seq. ID No. 5761	Seq. ID No. 5762
2749e	Seq. ID No. 5771	Seq. ID No. 5772
2750b	Seq. ID No. 5775	Seq. ID No. 5776
2752	Seq. ID No. 5777	Seq. ID No. 5778
2753	Seq. ID No. 5779	Seq. ID No. 5780
2757b	Seq. ID No. 5783	Seq. ID No. 5784
2758c	Seq. ID No. 5789	Seq. ID No. 5790
2759b	Seq. ID No. 5795	Seq. ID No. 5796
2760c	Seq. ID No. 5801	Seq. ID No. 5802
2762	Seq. ID No. 5803	Seq. ID No. 5804
2763c	Seq. ID No. 5809	Seq. ID No. 5810
2765c	Seq. ID No. 5815	Seq. ID No. 5816
2766b	Seq. ID No. 5819	Seq. ID No. 5820
2768c	Seq. ID No. 5825	Seq. ID No. 5826
2771b	Seq. ID No. 5833	Seq. ID No. 5834
2773	Seq. ID No. 5835	Seq. ID No. 5836
2774c	Seq. ID No. 5841	Seq. ID No. 5842

TABLE 18: GLIMMER™ ORFs

ORF Number	DNA SEQ ID Number	Protein SEQ ID Number
2776b	Seq. ID No. 5845	Seq. ID No. 5846
2777	Seq. ID No. 5847	Seq. ID No. 5848
2778	Seq. ID No. 5849	Seq. ID No. 5850
2779	Seq. ID No. 5851	Seq. ID No. 5852
2780	Seq. ID No. 5853	Seq. ID No. 5854
2784	Seq. ID No. 5855	Seq. ID No. 5856
2785b	Seq. ID No. 5859	Seq. ID No. 5860
2786c	Seq. ID No. 5865	Seq. ID No. 5866
2787c	Seq. ID No. 5871	Seq. ID No. 5872
2789	Seq. ID No. 5875	Seq. ID No. 5876
2790	Seq. ID No. 5877	Seq. ID No. 5878
2793	Seq. ID No. 5881	Seq. ID No. 5882
2798	Seq. ID No. 5887	Seq. ID No. 5888
2799b	Seq. ID No. 5891	Seq. ID No. 5892
2801b	Seq. ID No. 5895	Seq. ID No. 5896
2804	Seq. ID No. 5897	Seq. ID No. 5898
2805b	Seq. ID No. 5901	Seq. ID No. 5902
2809	Seq. ID No. 5903	Seq. ID No. 5904
2810d	Seq. ID No. 5911	Seq. ID No. 5912
2812	Seq. ID No. 5913	Seq. ID No. 5914
2814	Seq. ID No. 5915	Seq. ID No. 5916
2815	Seq. ID No. 5917	Seq. ID No. 5918
2816	Seq. ID No. 5919	Seq. ID No. 5920
2818e	Seq. ID No. 5929	Seq. ID No. 5930
2819	Seq. ID No. 5931	Seq. ID No. 5932
2820	Seq. ID No. 5933	Seq. ID No. 5934
2821b	Seq. ID No. 5937	Seq. ID No. 5938
2822b	Seq. ID No. 5941	Seq. ID No. 5942
2823	Seq. ID No. 5943	Seq. ID No. 5944

TABLE 18: GLIMMER™ ORFs

ORF Number	DNA SEQ ID Number	Protein SEQ ID Number
2824b	Seq. ID No. 5947	Seq. ID No. 5948
2829b	Seq. ID No. 5951	Seq. ID No. 5952
2831b	Seq. ID No. 5953	Seq. ID No. 5954
2832	Seq. ID No. 5955	Seq. ID No. 5956
2833	Seq. ID No. 5957	Seq. ID No. 5958
2834b	Seq. ID No. 5961	Seq. ID No. 5962
2842b	Seq. ID No. 5969	Seq. ID No. 5970
2843b	Seq. ID No. 5973	Seq. ID No. 5974
2846b	Seq. ID No. 5979	Seq. ID No. 5980
2848	Seq. ID No. 5981	Seq. ID No. 5982
2851	Seq. ID No. 5985	Seq. ID No. 5986
2853	Seq. ID No. 5989	Seq. ID No. 5990
2854b	Seq. ID No. 5993	Seq. ID No. 5994
2856c	Seq. ID No. 6001	Seq. ID No. 6002
2857	Seq. ID No. 6003	Seq. ID No. 6004
2860c	Seq. ID No. 6011	Seq. ID No. 6012
2863	Seq. ID No. 6015	Seq. ID No. 6016
2864	Seq. ID No. 6017	Seq. ID No. 6018
2868b	Seq. ID No. 6021	Seq. ID No. 6022
2869c	Seq. ID No. 6027	Seq. ID No. 6028
2871	Seq. ID No. 6029	Seq. ID No. 6030
2875	Seq. ID No. 6033	Seq. ID No. 6034
2877	Seq. ID No. 6035	Seq. ID No. 6036
2879c	Seq. ID No. 6041	Seq. ID No. 6042
2881	Seq. ID No. 6043	Seq. ID No. 6044
2883d	Seq. ID No. 6053	Seq. ID No. 6054
2886b	Seq. ID No. 6057	Seq. ID No. 6058
2890	Seq. ID No. 6065	Seq. ID No. 6066
2891c	Seq. ID No. 6071	Seq. ID No. 6072

TABLE 18: GLIMMER™ ORFs

ORF Number	DNA SEQ ID Number	Protein SEQ ID Number
2894c	Seq. ID No. 6079	Seq. ID No. 6080
2897b	Seq. ID No. 6085	Seq. ID No. 6086
2900b	Seq. ID No. 6089	Seq. ID No. 6090
2902	Seq. ID No. 6095	Seq. ID No. 6096
2904	Seq. ID No. 6097	Seq. ID No. 6098
2905b	Seq. ID No. 6101	Seq. ID No. 6102
2906	Seq. ID No. 6103	Seq. ID No. 6104
2909d	Seq. ID No. 6111	Seq. ID No. 6112
2912	Seq. ID No. 6113	Seq. ID No. 6114
2913b	Seq. ID No. 6117	Seq. ID No. 6118
2915c	Seq. ID No. 6123	Seq. ID No. 6124
2916	Seq. ID No. 6125	Seq. ID No. 6126
2918	Seq. ID No. 6129	Seq. ID No. 6130
2920	Seq. ID No. 6131	Seq. ID No. 6132
2921	Seq. ID No. 6133	Seq. ID No. 6134
2923c	Seq. ID No. 6141	Seq. ID No. 6142
2925b	Seq. ID No. 6145	Seq. ID No. 6146
2926b	Seq. ID No. 6149	Seq. ID No. 6150
2928c	Seq. ID No. 6157	Seq. ID No. 6158
2931c	Seq. ID No. 6165	Seq. ID No. 6166
2933b	Seq. ID No. 6169	Seq. ID No. 6170
2934	Seq. ID No. 6171	Seq. ID No. 6172
2935b	Seq. ID No. 6175	Seq. ID No. 6176
2936	Seq. ID No. 6177	Seq. ID No. 6178
2939b	Seq. ID No. 6181	Seq. ID No. 6182
2941c	Seq. ID No. 6187	Seq. ID No. 6188
2943d	Seq. ID No. 6195	Seq. ID No. 6196
2947	Seq. ID No. 6201	Seq. ID No. 6202
2948d	Seq. ID No. 6209	Seq. ID No. 6210

TABLE 18: GLIMMER™ ORFS

ORF Number	DNA SEQ ID Number	Protein SEQ ID Number
2950b	Seq. ID No. 6213	Seq. ID No. 6214
2951	Seq. ID No. 6215	Seq. ID No. 6216
2954	Seq. ID No. 6219	Seq. ID No. 6220
2955g	Seq. ID No. 6233	Seq. ID No. 6234
2957	Seq. ID No. 6235	Seq. ID No. 6236
2959	Seq. ID No. 6243	Seq. ID No. 6244
2962b	Seq. ID No. 6249	Seq. ID No. 6250
2963	Seq. ID No. 6251	Seq. ID No. 6252
2965c	Seq. ID No. 6257	Seq. ID No. 6258
2967	Seq. ID No. 6261	Seq. ID No. 6262
2969	Seq. ID No. 6263	Seq. ID No. 6264
2971b	Seq. ID No. 6271	Seq. ID No. 6272
2974b	Seq. ID No. 6275	Seq. ID No. 6276
2975	Seq. ID No. 6277	Seq. ID No. 6278
2977b	Seq. ID No. 6281	Seq. ID No. 6282
2979	Seq. ID No. 6287	Seq. ID No. 6288
2980e	Seq. ID No. 6297	Seq. ID No. 6298
2984	Seq. ID No. 6299	Seq. ID No. 6300
2986c	Seq. ID No. 6305	Seq. ID No. 6306
2988c	Seq. ID No. 6311	Seq. ID No. 6312
2990	Seq. ID No. 6315	Seq. ID No. 6316
2991c	Seq. ID No. 6321	Seq. ID No. 6322
2992	Seq. ID No. 6323	Seq. ID No. 6324
2993b	Seq. ID No. 6327	Seq. ID No. 6328
2995b	Seq. ID No. 6331	Seq. ID No. 6332
2997	Seq. ID No. 6333	Seq. ID No. 6334
2998b	Seq. ID No. 6337	Seq. ID No. 6338
2999	Seq. ID No. 6339	Seq. ID No. 6340
3001	Seq. ID No. 6341	Seq. ID No. 6342

TABLE 18: GLIMMER™ ORFs

ORF Number	DNA SEQ ID Number	Protein SEQ ID Number
3003	Seq. ID No. 6343	Seq. ID No. 6344
3005	Seq. ID No. 6345	Seq. ID No. 6346
3008d	Seq. ID No. 6353	Seq. ID No. 6354
3010b	Seq. ID No. 6357	Seq. ID No. 6358
3012	Seq. ID No. 6359	Seq. ID No. 6360
3015	Seq. ID No. 6361	Seq. ID No. 6362
3016c	Seq. ID No. 6367	Seq. ID No. 6368
3017	Seq. ID No. 6369	Seq. ID No. 6370
3018b	Seq. ID No. 6373	Seq. ID No. 6374
3020	Seq. ID No. 6375	Seq. ID No. 6376
3021	Seq. ID No. 6377	Seq. ID No. 6378
3022	Seq. ID No. 6379	Seq. ID No. 6380
3026b	Seq. ID No. 6389	Seq. ID No. 6390
3028c	Seq. ID No. 6395	Seq. ID No. 6396
3029b	Seq. ID No. 6399	Seq. ID No. 6400
3031b	Seq. ID No. 6403	Seq. ID No. 6404
3032b	Seq. ID No. 6407	Seq. ID No. 6408
3033b	Seq. ID No. 6411	Seq. ID No. 6412
3035	Seq. ID No. 6413	Seq. ID No. 6414
3037b	Seq. ID No. 6417	Seq. ID No. 6418
3040b	Seq. ID No. 6423	Seq. ID No. 6424
3044	Seq. ID No. 6433	Seq. ID No. 6434
3045b	Seq. ID No. 6437	Seq. ID No. 6438
3048a	Seq. ID No. 6439	Seq. ID No. 6440
3049c	Seq. ID No. 6445	Seq. ID No. 6446
3051b	Seq. ID No. 6449	Seq. ID No. 6450
3052	Seq. ID No. 6451	Seq. ID No. 6452
3055b	Seq. ID No. 6457	Seq. ID No. 6458
3057	Seq. ID No. 6459	Seq. ID No. 6460

TABLE 18: GLIMMER™ ORFs

ORF Number	DNA SEQ ID Number	Protein SEQ ID Number
3059	Seq. ID No. 6461	Seq. ID No. 6462
3060	Seq. ID No. 6463	Seq. ID No. 6464
3065b	Seq. ID No. 6477	Seq. ID No. 6478
3067	Seq. ID No. 6481	Seq. ID No. 6482
3068	Seq. ID No. 6483	Seq. ID No. 6484
3071	Seq. ID No. 6487	Seq. ID No. 6488
3072a	Seq. ID No. 6489	Seq. ID No. 6490
3073	Seq. ID No. 6491	Seq. ID No. 6492
3074	Seq. ID No. 6493	Seq. ID No. 6494
3075	Seq. ID No. 6495	Seq. ID No. 6496
3077c	Seq. ID No. 6503	Seq. ID No. 6504
3078	Seq. ID No. 6505	Seq. ID No. 6506
3081b	Seq. ID No. 6511	Seq. ID No. 6512
3083d	Seq. ID No. 6515	Seq. ID No. 6516
3086	Seq. ID No. 6519	Seq. ID No. 6520
3087c	Seq. ID No. 6523	Seq. ID No. 6524
3088	Seq. ID No. 6525	Seq. ID No. 6526
3089b	Seq. ID No. 6529	Seq. ID No. 6530
3090	Seq. ID No. 6531	Seq. ID No. 6532
3091	Seq. ID No. 6533	Seq. ID No. 6534
3092b	Seq. ID No. 6537	Seq. ID No. 6538
3097	Seq. ID No. 6545	Seq. ID No. 6546
3098c	Seq. ID No. 6551	Seq. ID No. 6552
3099	Seq. ID No. 6553	Seq. ID No. 6554
3101	Seq. ID No. 6559	Seq. ID No. 6560
3103b	Seq. ID No. 6563	Seq. ID No. 6564
3105	Seq. ID No. 6567	Seq. ID No. 6568
3108b	Seq. ID No. 6577	Seq. ID No. 6578
3109	Seq. ID No. 6579	Seq. ID No. 6580

TABLE 18: GLIMMER™ ORFs

ORF Number	DNA SEQ ID Number	Protein SEQ ID Number
3110b	Seq. ID No. 6583	Seq. ID No. 6584
3113	Seq. ID No. 6585	Seq. ID No. 6586
3116	Seq. ID No. 6587	Seq. ID No. 6588
3118a	Seq. ID No. 6589	Seq. ID No. 6590
3119f	Seq. ID No. 6603	Seq. ID No. 6604
3121	Seq. ID No. 6605	Seq. ID No. 6606
3122b	Seq. ID No. 6609	Seq. ID No. 6610
3123b	Seq. ID No. 6613	Seq. ID No. 6614
3124	Seq. ID No. 6615	Seq. ID No. 6616
3126	Seq. ID No. 6617	Seq. ID No. 6618
3129b	Seq. ID No. 6621	Seq. ID No. 6622
3131	Seq. ID No. 6623	Seq. ID No. 6624
3134b	Seq. ID No. 6627	Seq. ID No. 6628
3138	Seq. ID No. 6629	Seq. ID No. 6630
3141	Seq. ID No. 6633	Seq. ID No. 6634
3145c	Seq. ID No. 6639	Seq. ID No. 6640

Listed in Table 19 are the 1534 ORFs detected by the GeneMark™ ORF finder program trained on *Bacillus subtilis* published ORFs.

TABLE 19: GENEMARK™ ORFs

ORF Number	DNA SEQ ID Number	Protein SEQ ID Number
1	Seq. ID No. 1	Seq. ID No. 2
2a	Seq. ID No. 3	Seq. ID No. 4
4c	Seq. ID No. 11	Seq. ID No. 12
5	Seq. ID No. 13	Seq. ID No. 14
7	Seq. ID No. 15	Seq. ID No. 16
10	Seq. ID No. 17	Seq. ID No. 18

TABLE 19: GENEMARK™ ORFS

ORF Number	DNA SEQ ID Number	Protein SEQ ID Number
17	Seq. ID No. 25	Seq. ID No. 26
18	Seq. ID No. 27	Seq. ID No. 28
20	Seq. ID No. 29	Seq. ID No. 30
23b	Seq. ID No. 35	Seq. ID No. 36
24	Seq. ID No. 37	Seq. ID No. 38
32	Seq. ID No. 39	Seq. ID No. 40
36	Seq. ID No. 41	Seq. ID No. 42
37	Seq. ID No. 43	Seq. ID No. 44
38a	Seq. ID No. 45	Seq. ID No. 46
39a	Seq. ID No. 49	Seq. ID No. 50
40	Seq. ID No. 53	Seq. ID No. 54
41b	Seq. ID No. 57	Seq. ID No. 58
43b	Seq. ID No. 61	Seq. ID No. 62
45	Seq. ID No. 69	Seq. ID No. 70
46a	Seq. ID No. 71	Seq. ID No. 72
47	Seq. ID No. 75	Seq. ID No. 76
48c	Seq. ID No. 81	Seq. ID No. 82
50	Seq. ID No. 83	Seq. ID No. 84
51c	Seq. ID No. 89	Seq. ID No. 90
57a	Seq. ID No. 95	Seq. ID No. 96
60a	Seq. ID No. 101	Seq. ID No. 102
62c	Seq. ID No. 111	Seq. ID No. 112
65b	Seq. ID No. 119	Seq. ID No. 120
67	Seq. ID No. 125	Seq. ID No. 126
71	Seq. ID No. 129	Seq. ID No. 130
74	Seq. ID No. 135	Seq. ID No. 136
77	Seq. ID No. 137	Seq. ID No. 138
80a	Seq. ID No. 141	Seq. ID No. 142

TABLE 19: GENEMARK™ ORFS

ORF Number	DNA SEQ ID Number	Protein SEQ ID Number
81a	Seq. ID No. 147	Seq. ID No. 148
83	Seq. ID No. 151	Seq. ID No. 152
85b	Seq. ID No. 155	Seq. ID No. 156
88	Seq. ID No. 167	Seq. ID No. 168
91a	Seq. ID No. 171	Seq. ID No. 172
93b	Seq. ID No. 181	Seq. ID No. 182
94	Seq. ID No. 185	Seq. ID No. 186
95b	Seq. ID No. 187	Seq. ID No. 188
97b	Seq. ID No. 189	Seq. ID No. 190
99	Seq. ID No. 191	Seq. ID No. 192
102	Seq. ID No. 195	Seq. ID No. 196
104b	Seq. ID No. 199	Seq. ID No. 200
106	Seq. ID No. 207	Seq. ID No. 208
109c	Seq. ID No. 213	Seq. ID No. 214
111b	Seq. ID No. 219	Seq. ID No. 220
112a	Seq. ID No. 221	Seq. ID No. 222
114	Seq. ID No. 225	Seq. ID No. 226
115	Seq. ID No. 227	Seq. ID No. 228
119a	Seq. ID No. 229	Seq. ID No. 230
121	Seq. ID No. 233	Seq. ID No. 234
124c	Seq. ID No. 239	Seq. ID No. 240
125	Seq. ID No. 241	Seq. ID No. 242
127a	Seq. ID No. 243	Seq. ID No. 244
129c	Seq. ID No. 253	Seq. ID No. 254
134	Seq. ID No. 261	Seq. ID No. 262
135a	Seq. ID No. 263	Seq. ID No. 264
137a	Seq. ID No. 267	Seq. ID No. 268
138b	Seq. ID No. 273	Seq. ID No. 274

TABLE 19: GENEMARK™ ORFS

ORF Number	DNA SEQ ID Number	Protein SEQ ID Number
142	Seq. ID No. 275	Seq. ID No. 276
143	Seq. ID No. 277	Seq. ID No. 278
144a	Seq. ID No. 279	Seq. ID No. 280
145d	Seq. ID No. 291	Seq. ID No. 292
147	Seq. ID No. 293	Seq. ID No. 294
151a	Seq. ID No. 295	Seq. ID No. 296
152a	Seq. ID No. 299	Seq. ID No. 300
153a	Seq. ID No. 303	Seq. ID No. 304
154	Seq. ID No. 309	Seq. ID No. 310
155a	Seq. ID No. 311	Seq. ID No. 312
157a	Seq. ID No. 315	Seq. ID No. 316
158a	Seq. ID No. 319	Seq. ID No. 320
160a	Seq. ID No. 323	Seq. ID No. 324
162c	Seq. ID No. 331	Seq. ID No. 332
165a	Seq. ID No. 341	Seq. ID No. 342
167	Seq. ID No. 345	Seq. ID No. 346
171a	Seq. ID No. 351	Seq. ID No. 352
172	Seq. ID No. 355	Seq. ID No. 356
175	Seq. ID No. 361	Seq. ID No. 362
176	Seq. ID No. 363	Seq. ID No. 364
177a	Seq. ID No. 365	Seq. ID No. 366
180b	Seq. ID No. 375	Seq. ID No. 376
184	Seq. ID No. 379	Seq. ID No. 380
185	Seq. ID No. 381	Seq. ID No. 382
186	Seq. ID No. 383	Seq. ID No. 384
188	Seq. ID No. 389	Seq. ID No. 390
189b	Seq. ID No. 391	Seq. ID No. 392
192a	Seq. ID No. 395	Seq. ID No. 396

TABLE 19: GENEMARK™ ORFS

ORF Number	DNA SEQ ID Number	Protein SEQ ID Number
193	Seq. ID No. 399	Seq. ID No. 400
195	Seq. ID No. 405	Seq. ID No. 406
197a	Seq. ID No. 409	Seq. ID No. 410
198a	Seq. ID No. 413	Seq. ID No. 414
200	Seq. ID No. 417	Seq. ID No. 418
202	Seq. ID No. 421	Seq. ID No. 422
203	Seq. ID No. 423	Seq. ID No. 424
204	Seq. ID No. 425	Seq. ID No. 426
205	Seq. ID No. 427	Seq. ID No. 428
206	Seq. ID No. 429	Seq. ID No. 430
208b	Seq. ID No. 435	Seq. ID No. 436
210	Seq. ID No. 437	Seq. ID No. 438
211	Seq. ID No. 439	Seq. ID No. 440
213	Seq. ID No. 441	Seq. ID No. 442
215a	Seq. ID No. 443	Seq. ID No. 444
218	Seq. ID No. 445	Seq. ID No. 446
219	Seq. ID No. 447	Seq. ID No. 448
220a	Seq. ID No. 449	Seq. ID No. 450
226a	Seq. ID No. 459	Seq. ID No. 460
228a	Seq. ID No. 465	Seq. ID No. 466
236c	Seq. ID No. 485	Seq. ID No. 486
245c	Seq. ID No. 501	Seq. ID No. 502
246b	Seq. ID No. 505	Seq. ID No. 506
248b	Seq. ID No. 511	Seq. ID No. 512
249a	Seq. ID No. 513	Seq. ID No. 514
251	Seq. ID No. 517	Seq. ID No. 518
253a	Seq. ID No. 519	Seq. ID No. 520
254	Seq. ID No. 523	Seq. ID No. 524

TABLE 19: GENEMARK™ ORFs

ORF Number	DNA SEQ ID Number	Protein SEQ ID Number
255c	Seq. ID No. 529	Seq. ID No. 530
258	Seq. ID No. 533	Seq. ID No. 534
259a	Seq. ID No. 535	Seq. ID No. 536
260	Seq. ID No. 541	Seq. ID No. 542
262	Seq. ID No. 543	Seq. ID No. 544
265	Seq. ID No. 551	Seq. ID No. 552
267b	Seq. ID No. 553	Seq. ID No. 554
269a	Seq. ID No. 559	Seq. ID No. 560
271a	Seq. ID No. 563	Seq. ID No. 564
273b	Seq. ID No. 569	Seq. ID No. 570
277c	Seq. ID No. 575	Seq. ID No. 576
279b	Seq. ID No. 579	Seq. ID No. 580
280b	Seq. ID No. 583	Seq. ID No. 584
283a	Seq. ID No. 591	Seq. ID No. 592
284a	Seq. ID No. 595	Seq. ID No. 596
286a	Seq. ID No. 601	Seq. ID No. 602
287	Seq. ID No. 605	Seq. ID No. 606
290a	Seq. ID No. 607	Seq. ID No. 608
293	Seq. ID No. 611	Seq. ID No. 612
294	Seq. ID No. 613	Seq. ID No. 614
296	Seq. ID No. 615	Seq. ID No. 616
301a	Seq. ID No. 621	Seq. ID No. 622
304b	Seq. ID No. 627	Seq. ID No. 628
307	Seq. ID No. 629	Seq. ID No. 630
309	Seq. ID No. 633	Seq. ID No. 634
310	Seq. ID No. 635	Seq. ID No. 636
311	Seq. ID No. 637	Seq. ID No. 638
313c	Seq. ID No. 643	Seq. ID No. 644

TABLE 19: GENEMARK™ ORFS

ORF Number	DNA SEQ ID Number	Protein SEQ ID Number
315	Seq. ID No. 649	Seq. ID No. 650
316a	Seq. ID No. 651	Seq. ID No. 652
317b	Seq. ID No. 655	Seq. ID No. 656
318a	Seq. ID No. 657	Seq. ID No. 658
321	Seq. ID No. 669	Seq. ID No. 670
323a	Seq. ID No. 671	Seq. ID No. 672
324	Seq. ID No. 675	Seq. ID No. 676
327c	Seq. ID No. 681	Seq. ID No. 682
329	Seq. ID No. 683	Seq. ID No. 684
330a	Seq. ID No. 685	Seq. ID No. 686
332	Seq. ID No. 693	Seq. ID No. 694
337	Seq. ID No. 703	Seq. ID No. 704
338a	Seq. ID No. 705	Seq. ID No. 706
341a	Seq. ID No. 711	Seq. ID No. 712
342f	Seq. ID No. 725	Seq. ID No. 726
344a	Seq. ID No. 731	Seq. ID No. 732
345	Seq. ID No. 735	Seq. ID No. 736
346a	Seq. ID No. 737	Seq. ID No. 738
347	Seq. ID No. 741	Seq. ID No. 742
349a	Seq. ID No. 743	Seq. ID No. 744
350a	Seq. ID No. 749	Seq. ID No. 750
351	Seq. ID No. 753	Seq. ID No. 754
352c	Seq. ID No. 759	Seq. ID No. 760
356c	Seq. ID No. 773	Seq. ID No. 774
358c	Seq. ID No. 781	Seq. ID No. 782
362	Seq. ID No. 783	Seq. ID No. 784
365a	Seq. ID No. 785	Seq. ID No. 786
366b	Seq. ID No. 789	Seq. ID No. 790

TABLE 19: GENEMARK™ ORFS

ORF Number	DNA SEQ ID Number	Protein SEQ ID Number
367a	Seq. ID No. 793	Seq. ID No. 794
371a	Seq. ID No. 797	Seq. ID No. 798
372b	Seq. ID No. 803	Seq. ID No. 804
378a	Seq. ID No. 815	Seq. ID No. 816
382b	Seq. ID No. 819	Seq. ID No. 820
383a	Seq. ID No. 821	Seq. ID No. 822
384b	Seq. ID No. 827	Seq. ID No. 828
385b	Seq. ID No. 831	Seq. ID No. 832
386	Seq. ID No. 833	Seq. ID No. 834
387	Seq. ID No. 835	Seq. ID No. 836
390	Seq. ID No. 837	Seq. ID No. 838
393b	Seq. ID No. 841	Seq. ID No. 842
395a	Seq. ID No. 843	Seq. ID No. 844
396	Seq. ID No. 849	Seq. ID No. 850
398	Seq. ID No. 851	Seq. ID No. 852
400a	Seq. ID No. 853	Seq. ID No. 854
401a	Seq. ID No. 857	Seq. ID No. 858
403c	Seq. ID No. 865	Seq. ID No. 866
406a	Seq. ID No. 869	Seq. ID No. 870
409a	Seq. ID No. 873	Seq. ID No. 874
410a	Seq. ID No. 877	Seq. ID No. 878
413a	Seq. ID No. 883	Seq. ID No. 884
416a	Seq. ID No. 887	Seq. ID No. 888
417	Seq. ID No. 891	Seq. ID No. 892
418b	Seq. ID No. 895	Seq. ID No. 896
419c	Seq. ID No. 901	Seq. ID No. 902
421	Seq. ID No. 907	Seq. ID No. 908
424a	Seq. ID No. 911	Seq. ID No. 912

TABLE 19: GENEMARK™ ORFS

ORF Number	DNA SEQ ID Number	Protein SEQ ID Number
426a	Seq. ID No. 917	Seq. ID No. 918
427a	Seq. ID No. 921	Seq. ID No. 922
429a	Seq. ID No. 927	Seq. ID No. 928
431	Seq. ID No. 935	Seq. ID No. 936
435	Seq. ID No. 939	Seq. ID No. 940
438a	Seq. ID No. 945	Seq. ID No. 946
440	Seq. ID No. 951	Seq. ID No. 952
441a	Seq. ID No. 953	Seq. ID No. 954
444a	Seq. ID No. 959	Seq. ID No. 960
445a	Seq. ID No. 963	Seq. ID No. 964
448	Seq. ID No. 967	Seq. ID No. 968
450a	Seq. ID No. 969	Seq. ID No. 970
452a	Seq. ID No. 977	Seq. ID No. 978
455a	Seq. ID No. 989	Seq. ID No. 990
458a	Seq. ID No. 995	Seq. ID No. 996
460a	Seq. ID No. 999	Seq. ID No. 1000
462	Seq. ID No. 1005	Seq. ID No. 1006
463a	Seq. ID No. 1007	Seq. ID No. 1008
464c	Seq. ID No. 1015	Seq. ID No. 1016
467a	Seq. ID No. 1021	Seq. ID No. 1022
472d	Seq. ID No. 1035	Seq. ID No. 1036
473	Seq. ID No. 1041	Seq. ID No. 1042
474	Seq. ID No. 1043	Seq. ID No. 1044
478a	Seq. ID No. 1049	Seq. ID No. 1050
479	Seq. ID No. 1053	Seq. ID No. 1054
480b	Seq. ID No. 1057	Seq. ID No. 1058
481a	Seq. ID No. 1059	Seq. ID No. 1060
482a	Seq. ID No. 1063	Seq. ID No. 1064

TABLE 19: GENEMARK™ ORFS

ORF Number	DNA SEQ ID Number	Protein SEQ ID Number
483	Seq. ID No. 1067	Seq. ID No. 1068
490	Seq. ID No. 1069	Seq. ID No. 1070
491a	Seq. ID No. 1071	Seq. ID No. 1072
492	Seq. ID No. 1075	Seq. ID No. 1076
495c	Seq. ID No. 1083	Seq. ID No. 1084
498a	Seq. ID No. 1085	Seq. ID No. 1086
499a	Seq. ID No. 1089	Seq. ID No. 1090
500	Seq. ID No. 1093	Seq. ID No. 1094
502c	Seq. ID No. 1097	Seq. ID No. 1098
504	Seq. ID No. 1099	Seq. ID No. 1100
505a	Seq. ID No. 1101	Seq. ID No. 1102
509	Seq. ID No. 1109	Seq. ID No. 1110
512a	Seq. ID No. 1113	Seq. ID No. 1114
514	Seq. ID No. 1117	Seq. ID No. 1118
515b	Seq. ID No. 1121	Seq. ID No. 1122
518c	Seq. ID No. 1129	Seq. ID No. 1130
523	Seq. ID No. 1133	Seq. ID No. 1134
524b	Seq. ID No. 1137	Seq. ID No. 1138
527a	Seq. ID No. 1141	Seq. ID No. 1142
528a	Seq. ID No. 1145	Seq. ID No. 1146
529	Seq. ID No. 1149	Seq. ID No. 1150
533	Seq. ID No. 1155	Seq. ID No. 1156
535	Seq. ID No. 1157	Seq. ID No. 1158
536	Seq. ID No. 1159	Seq. ID No. 1160
539c	Seq. ID No. 1163	Seq. ID No. 1164
541d	Seq. ID No. 1171	Seq. ID No. 1172
542	Seq. ID No. 1173	Seq. ID No. 1174
543a	Seq. ID No. 1175	Seq. ID No. 1176

TABLE 19: GENEMARK™ ORFs

ORF Number	DNA SEQ ID Number	Protein SEQ ID Number
544	Seq. ID No. 1181	Seq. ID No. 1182
545b	Seq. ID No. 1185	Seq. ID No. 1186
546a	Seq. ID No. 1189	Seq. ID No. 1190
548	Seq. ID No. 1199	Seq. ID No. 1200
551	Seq. ID No. 1205	Seq. ID No. 1206
554a	Seq. ID No. 1209	Seq. ID No. 1210
557a	Seq. ID No. 1215	Seq. ID No. 1216
560a	Seq. ID No. 1219	Seq. ID No. 1220
561	Seq. ID No. 1223	Seq. ID No. 1224
563	Seq. ID No. 1225	Seq. ID No. 1226
569	Seq. ID No. 1233	Seq. ID No. 1234
570a	Seq. ID No. 1235	Seq. ID No. 1236
573	Seq. ID No. 1241	Seq. ID No. 1242
580a	Seq. ID No. 1251	Seq. ID No. 1252
583a	Seq. ID No. 1255	Seq. ID No. 1256
586a	Seq. ID No. 1261	Seq. ID No. 1262
587d	Seq. ID No. 1271	Seq. ID No. 1272
590	Seq. ID No. 1281	Seq. ID No. 1282
609a	Seq. ID No. 1315	Seq. ID No. 1316
611	Seq. ID No. 1323	Seq. ID No. 1324
613d	Seq. ID No. 1331	Seq. ID No. 1332
614a	Seq. ID No. 1333	Seq. ID No. 1334
618	Seq. ID No. 1339	Seq. ID No. 1340
620	Seq. ID No. 1345	Seq. ID No. 1346
623	Seq. ID No. 1347	Seq. ID No. 1348
625	Seq. ID No. 1355	Seq. ID No. 1356
626a	Seq. ID No. 1357	Seq. ID No. 1358
631d	Seq. ID No. 1369	Seq. ID No. 1370

TABLE 19: GENEMARK™ ORFS

ORF Number	DNA SEQ ID Number	Protein SEQ ID Number
633a	Seq. ID No. 1373	Seq. ID No. 1374
637c	Seq. ID No. 1387	Seq. ID No. 1388
641a	Seq. ID No. 1391	Seq. ID No. 1392
643	Seq. ID No. 1395	Seq. ID No. 1396
644a	Seq. ID No. 1397	Seq. ID No. 1398
650	Seq. ID No. 1403	Seq. ID No. 1404
652	Seq. ID No. 1405	Seq. ID No. 1406
653a	Seq. ID No. 1407	Seq. ID No. 1408
656	Seq. ID No. 1413	Seq. ID No. 1414
657c	Seq. ID No. 1415	Seq. ID No. 1416
658a	Seq. ID No. 1417	Seq. ID No. 1418
661	Seq. ID No. 1425	Seq. ID No. 1426
663	Seq. ID No. 1427	Seq. ID No. 1428
665	Seq. ID No. 1429	Seq. ID No. 1430
666	Seq. ID No. 1431	Seq. ID No. 1432
670	Seq. ID No. 1433	Seq. ID No. 1434
674a	Seq. ID No. 1435	Seq. ID No. 1436
676	Seq. ID No. 1439	Seq. ID No. 1440
677a	Seq. ID No. 1441	Seq. ID No. 1442
681	Seq. ID No. 1451	Seq. ID No. 1452
683a	Seq. ID No. 1453	Seq. ID No. 1454
687	Seq. ID No. 1459	Seq. ID No. 1460
688a	Seq. ID No. 1461	Seq. ID No. 1462
691b	Seq. ID No. 1469	Seq. ID No. 1470
692	Seq. ID No. 1471	Seq. ID No. 1472
694	Seq. ID No. 1473	Seq. ID No. 1474
696	Seq. ID No. 1475	Seq. ID No. 1476
698	Seq. ID No. 1477	Seq. ID No. 1478

TABLE 19: GENEMARK™ ORFS

ORF Number	DNA SEQ ID Number	Protein SEQ ID Number
700b	Seq. ID No. 1483	Seq. ID No. 1484
703	Seq. ID No. 1487	Seq. ID No. 1488
705a	Seq. ID No. 1489	Seq. ID No. 1490
707	Seq. ID No. 1493	Seq. ID No. 1494
709	Seq. ID No. 1495	Seq. ID No. 1496
710	Seq. ID No. 1497	Seq. ID No. 1498
712b	Seq. ID No. 1501	Seq. ID No. 1502
715a	Seq. ID No. 1503	Seq. ID No. 1504
717	Seq. ID No. 1507	Seq. ID No. 1508
718a	Seq. ID No. 1509	Seq. ID No. 1510
722c	Seq. ID No. 1517	Seq. ID No. 1518
724b	Seq. ID No. 1521	Seq. ID No. 1522
726	Seq. ID No. 1527	Seq. ID No. 1528
728b	Seq. ID No. 1531	Seq. ID No. 1532
730c	Seq. ID No. 1537	Seq. ID No. 1538
731b	Seq. ID No. 1541	Seq. ID No. 1542
732	Seq. ID No. 1543	Seq. ID No. 1544
738c	Seq. ID No. 1549	Seq. ID No. 1550
743b	Seq. ID No. 1561	Seq. ID No. 1562
744	Seq. ID No. 1563	Seq. ID No. 1564
745a	Seq. ID No. 1565	Seq. ID No. 1566
746a	Seq. ID No. 1569	Seq. ID No. 1570
747	Seq. ID No. 1573	Seq. ID No. 1574
748a	Seq. ID No. 1575	Seq. ID No. 1576
751	Seq. ID No. 1581	Seq. ID No. 1582
754c	Seq. ID No. 1587	Seq. ID No. 1588
756a	Seq. ID No. 1591	Seq. ID No. 1592
758	Seq. ID No. 1595	Seq. ID No. 1596

TABLE 19: GENEMARK™ ORFs

ORF Number	DNA SEQ ID Number	Protein SEQ ID Number
760	Seq. ID No. 1597	Seq. ID No. 1598
763a	Seq. ID No. 1605	Seq. ID No. 1606
764	Seq. ID No. 1609	Seq. ID No. 1610
767	Seq. ID No. 1613	Seq. ID No. 1614
770c	Seq. ID No. 1619	Seq. ID No. 1620
772b	Seq. ID No. 1623	Seq. ID No. 1624
775	Seq. ID No. 1627	Seq. ID No. 1628
777a	Seq. ID No. 1629	Seq. ID No. 1630
780a	Seq. ID No. 1635	Seq. ID No. 1636
785	Seq. ID No. 1641	Seq. ID No. 1642
788b	Seq. ID No. 1647	Seq. ID No. 1648
789b	Seq. ID No. 1651	Seq. ID No. 1652
792	Seq. ID No. 1657	Seq. ID No. 1658
794a	Seq. ID No. 1659	Seq. ID No. 1660
795	Seq. ID No. 1667	Seq. ID No. 1668
797	Seq. ID No. 1669	Seq. ID No. 1670
799e	Seq. ID No. 1679	Seq. ID No. 1680
803a	Seq. ID No. 1683	Seq. ID No. 1684
804a	Seq. ID No. 1687	Seq. ID No. 1688
807	Seq. ID No. 1691	Seq. ID No. 1692
812	Seq. ID No. 1697	Seq. ID No. 1698
813	Seq. ID No. 1699	Seq. ID No. 1700
816	Seq. ID No. 1701	Seq. ID No. 1702
826	Seq. ID No. 1707	Seq. ID No. 1708
829a	Seq. ID No. 1709	Seq. ID No. 1710
830	Seq. ID No. 1713	Seq. ID No. 1714
834b	Seq. ID No. 1717	Seq. ID No. 1718
835a	Seq. ID No. 1721	Seq. ID No. 1722

TABLE 19: GENEMARK™ ORFS

ORF Number	DNA SEQ ID Number	Protein SEQ ID Number
836a	Seq. ID No. 1725	Seq. ID No. 1726
837c	Seq. ID No. 1735	Seq. ID No. 1736
843	Seq. ID No. 1737	Seq. ID No. 1738
847a	Seq. ID No. 1739	Seq. ID No. 1740
848	Seq. ID No. 1743	Seq. ID No. 1744
849a	Seq. ID No. 1745	Seq. ID No. 1746
851a	Seq. ID No. 1749	Seq. ID No. 1750
853b	Seq. ID No. 1755	Seq. ID No. 1756
859c	Seq. ID No. 1769	Seq. ID No. 1770
860	Seq. ID No. 1773	Seq. ID No. 1774
863	Seq. ID No. 1777	Seq. ID No. 1778
866b	Seq. ID No. 1785	Seq. ID No. 1786
868b	Seq. ID No. 1789	Seq. ID No. 1790
870	Seq. ID No. 1791	Seq. ID No. 1792
873c	Seq. ID No. 1797	Seq. ID No. 1798
874a	Seq. ID No. 1799	Seq. ID No. 1800
875	Seq. ID No. 1803	Seq. ID No. 1804
876	Seq. ID No. 1805	Seq. ID No. 1806
878a	Seq. ID No. 1807	Seq. ID No. 1808
880c	Seq. ID No. 1817	Seq. ID No. 1818
885	Seq. ID No. 1819	Seq. ID No. 1820
886	Seq. ID No. 1821	Seq. ID No. 1822
888	Seq. ID No. 1825	Seq. ID No. 1826
890a	Seq. ID No. 1827	Seq. ID No. 1828
894	Seq. ID No. 1831	Seq. ID No. 1832
907a	Seq. ID No. 1835	Seq. ID No. 1836
908b	Seq. ID No. 1841	Seq. ID No. 1842
911	Seq. ID No. 1845	Seq. ID No. 1846

TABLE 19: GENEMARK™ ORFs

ORF Number	DNA SEQ ID Number	Protein SEQ ID Number
912	Seq. ID No. 1847	Seq. ID No. 1848
916	Seq. ID No. 1849	Seq. ID No. 1850
917	Seq. ID No. 1851	Seq. ID No. 1852
918c	Seq. ID No. 1855	Seq. ID No. 1856
923	Seq. ID No. 1859	Seq. ID No. 1860
925a	Seq. ID No. 1861	Seq. ID No. 1862
926	Seq. ID No. 1865	Seq. ID No. 1866
927	Seq. ID No. 1867	Seq. ID No. 1868
929b	Seq. ID No. 1871	Seq. ID No. 1872
930	Seq. ID No. 1873	Seq. ID No. 1874
932	Seq. ID No. 1877	Seq. ID No. 1878
934a	Seq. ID No. 1879	Seq. ID No. 1880
935	Seq. ID No. 1887	Seq. ID No. 1888
938	Seq. ID No. 1889	Seq. ID No. 1890
939c	Seq. ID No. 1895	Seq. ID No. 1896
942	Seq. ID No. 1897	Seq. ID No. 1898
943	Seq. ID No. 1899	Seq. ID No. 1900
944a	Seq. ID No. 1901	Seq. ID No. 1902
946	Seq. ID No. 1905	Seq. ID No. 1906
949b	Seq. ID No. 1909	Seq. ID No. 1910
951a	Seq. ID No. 1917	Seq. ID No. 1918
952a	Seq. ID No. 1921	Seq. ID No. 1922
954	Seq. ID No. 1925	Seq. ID No. 1926
956	Seq. ID No. 1931	Seq. ID No. 1932
958a	Seq. ID No. 1933	Seq. ID No. 1934
959	Seq. ID No. 1937	Seq. ID No. 1938
961a	Seq. ID No. 1939	Seq. ID No. 1940
963	Seq. ID No. 1945	Seq. ID No. 1946

TABLE 19: GENEMARK™ ORFS

ORF Number	DNA SEQ ID Number	Protein SEQ ID Number
965a	Seq. ID No. 1947	Seq. ID No. 1948
966a	Seq. ID No. 1951	Seq. ID No. 1952
967a	Seq. ID No. 1955	Seq. ID No. 1956
968	Seq. ID No. 1959	Seq. ID No. 1960
969	Seq. ID No. 1961	Seq. ID No. 1962
972b	Seq. ID No. 1965	Seq. ID No. 1966
976	Seq. ID No. 1967	Seq. ID No. 1968
977a	Seq. ID No. 1969	Seq. ID No. 1970
978a	Seq. ID No. 1973	Seq. ID No. 1974
979	Seq. ID No. 1977	Seq. ID No. 1978
980	Seq. ID No. 1979	Seq. ID No. 1980
982	Seq. ID No. 1983	Seq. ID No. 1984
986	Seq. ID No. 1989	Seq. ID No. 1990
987	Seq. ID No. 1991	Seq. ID No. 1992
988c	Seq. ID No. 1997	Seq. ID No. 1998
991	Seq. ID No. 2001	Seq. ID No. 2002
992	Seq. ID No. 2003	Seq. ID No. 2004
997	Seq. ID No. 2011	Seq. ID No. 2012
1000	Seq. ID No. 2021	Seq. ID No. 2022
1001	Seq. ID No. 2023	Seq. ID No. 2024
1004a	Seq. ID No. 2029	Seq. ID No. 2030
1006a	Seq. ID No. 2033	Seq. ID No. 2034
1007	Seq. ID No. 2037	Seq. ID No. 2038
1012	Seq. ID No. 2039	Seq. ID No. 2040
1013c	Seq. ID No. 2045	Seq. ID No. 2046
1016c	Seq. ID No. 2047	Seq. ID No. 2048
1017b	Seq. ID No. 2051	Seq. ID No. 2052
1018a	Seq. ID No. 2057	Seq. ID No. 2058

TABLE 19: GENEMARK™ ORFS

ORF Number	DNA SEQ ID Number	Protein SEQ ID Number
1021a	Seq. ID No. 2061	Seq. ID No. 2062
1024	Seq. ID No. 2067	Seq. ID No. 2068
1025	Seq. ID No. 2069	Seq. ID No. 2070
1026	Seq. ID No. 2071	Seq. ID No. 2072
1029	Seq. ID No. 2073	Seq. ID No. 2074
1033b	Seq. ID No. 2077	Seq. ID No. 2078
1036b	Seq. ID No. 2089	Seq. ID No. 2090
1037	Seq. ID No. 2093	Seq. ID No. 2094
1039a	Seq. ID No. 2095	Seq. ID No. 2096
1041	Seq. ID No. 2099	Seq. ID No. 2100
1042a	Seq. ID No. 2101	Seq. ID No. 2102
1047a	Seq. ID No. 2113	Seq. ID No. 2114
1049a	Seq. ID No. 2117	Seq. ID No. 2118
1050b	Seq. ID No. 2123	Seq. ID No. 2124
1057	Seq. ID No. 2135	Seq. ID No. 2136
1058	Seq. ID No. 2137	Seq. ID No. 2138
1060a	Seq. ID No. 2139	Seq. ID No. 2140
1062	Seq. ID No. 2143	Seq. ID No. 2144
1064	Seq. ID No. 2147	Seq. ID No. 2148
1065c	Seq. ID No. 2153	Seq. ID No. 2154
1067	Seq. ID No. 2159	Seq. ID No. 2160
1070a	Seq. ID No. 2163	Seq. ID No. 2164
1076a	Seq. ID No. 2167	Seq. ID No. 2168
1077c	Seq. ID No. 2175	Seq. ID No. 2176
1079a	Seq. ID No. 2181	Seq. ID No. 2182
1080a	Seq. ID No. 2185	Seq. ID No. 2186
1081b	Seq. ID No. 2189	Seq. ID No. 2190
1085	Seq. ID No. 2193	Seq. ID No. 2194

TABLE 19: GENEMARK™ ORFS

ORF Number	DNA SEQ ID Number	Protein SEQ ID Number
1086	Seq. ID No. 2195	Seq. ID No. 2196
1087a	Seq. ID No. 2197	Seq. ID No. 2198
1094a	Seq. ID No. 2205	Seq. ID No. 2206
1096c	Seq. ID No. 2217	Seq. ID No. 2218
1097	Seq. ID No. 2219	Seq. ID No. 2220
1100	Seq. ID No. 2223	Seq. ID No. 2224
1101a	Seq. ID No. 2225	Seq. ID No. 2226
1104	Seq. ID No. 2229	Seq. ID No. 2230
1108b	Seq. ID No. 2235	Seq. ID No. 2236
1111b	Seq. ID No. 2239	Seq. ID No. 2240
1112a	Seq. ID No. 2243	Seq. ID No. 2244
1125	Seq. ID No. 2245	Seq. ID No. 2246
1126a	Seq. ID No. 2247	Seq. ID No. 2248
1127	Seq. ID No. 2253	Seq. ID No. 2254
1128	Seq. ID No. 2255	Seq. ID No. 2256
1131	Seq. ID No. 2257	Seq. ID No. 2258
1132	Seq. ID No. 2259	Seq. ID No. 2260
1135a	Seq. ID No. 2261	Seq. ID No. 2262
1136a	Seq. ID No. 2265	Seq. ID No. 2266
1138	Seq. ID No. 2269	Seq. ID No. 2270
1140b	Seq. ID No. 2273	Seq. ID No. 2274
1144b	Seq. ID No. 2285	Seq. ID No. 2286
1146e	Seq. ID No. 2297	Seq. ID No. 2298
1148	Seq. ID No. 2299	Seq. ID No. 2300
1149	Seq. ID No. 2301	Seq. ID No. 2302
1152f	Seq. ID No. 2313	Seq. ID No. 2314
1155f	Seq. ID No. 2327	Seq. ID No. 2328
1158a	Seq. ID No. 2331	Seq. ID No. 2332

TABLE 19: GENEMARK™ ORFS

ORF Number	DNA SEQ ID Number	Protein SEQ ID Number
1160	Seq. ID No. 2335	Seq. ID No. 2336
1161a	Seq. ID No. 2337	Seq. ID No. 2338
1162	Seq. ID No. 2341	Seq. ID No. 2342
1165	Seq. ID No. 2343	Seq. ID No. 2344
1166	Seq. ID No. 2345	Seq. ID No. 2346
1167b	Seq. ID No. 2349	Seq. ID No. 2350
1168	Seq. ID No. 2351	Seq. ID No. 2352
1169c	Seq. ID No. 2357	Seq. ID No. 2358
1170	Seq. ID No. 2359	Seq. ID No. 2360
1171a	Seq. ID No. 2361	Seq. ID No. 2362
1172	Seq. ID No. 2365	Seq. ID No. 2366
1174	Seq. ID No. 2369	Seq. ID No. 2370
1177	Seq. ID No. 2373	Seq. ID No. 2374
1179a	Seq. ID No. 2377	Seq. ID No. 2378
1180a	Seq. ID No. 2383	Seq. ID No. 2384
1183a	Seq. ID No. 2397	Seq. ID No. 2398
1184	Seq. ID No. 2401	Seq. ID No. 2402
1185a	Seq. ID No. 2403	Seq. ID No. 2404
1186b	Seq. ID No. 2409	Seq. ID No. 2410
1188a	Seq. ID No. 2411	Seq. ID No. 2412
1191	Seq. ID No. 2417	Seq. ID No. 2418
1192b	Seq. ID No. 2421	Seq. ID No. 2422
1194	Seq. ID No. 2423	Seq. ID No. 2424
1196a	Seq. ID No. 2425	Seq. ID No. 2426
1197	Seq. ID No. 2429	Seq. ID No. 2430
1199b	Seq. ID No. 2435	Seq. ID No. 2436
1200	Seq. ID No. 2437	Seq. ID No. 2438
1201	Seq. ID No. 2439	Seq. ID No. 2440

TABLE 19: GENEMARK™ ORFS

ORF Number	DNA SEQ ID Number	Protein SEQ ID Number
1202a	Seq. ID No. 2441	Seq. ID No. 2442
1205	Seq. ID No. 2445	Seq. ID No. 2446
1207	Seq. ID No. 2449	Seq. ID No. 2450
1208	Seq. ID No. 2451	Seq. ID No. 2452
1209	Seq. ID No. 2453	Seq. ID No. 2454
1213a	Seq. ID No. 2461	Seq. ID No. 2462
1214	Seq. ID No. 2465	Seq. ID No. 2466
1215a	Seq. ID No. 2467	Seq. ID No. 2468
1217c	Seq. ID No. 2471	Seq. ID No. 2472
1218a	Seq. ID No. 2473	Seq. ID No. 2474
1219	Seq. ID No. 2477	Seq. ID No. 2478
1220	Seq. ID No. 2479	Seq. ID No. 2480
1221a	Seq. ID No. 2481	Seq. ID No. 2482
1223	Seq. ID No. 2485	Seq. ID No. 2486
1224a	Seq. ID No. 2487	Seq. ID No. 2488
1226	Seq. ID No. 2495	Seq. ID No. 2496
1230	Seq. ID No. 2505	Seq. ID No. 2506
1231	Seq. ID No. 2507	Seq. ID No. 2508
1233a	Seq. ID No. 2509	Seq. ID No. 2510
1234c	Seq. ID No. 2519	Seq. ID No. 2520
1237	Seq. ID No. 2525	Seq. ID No. 2526
1239	Seq. ID No. 2527	Seq. ID No. 2528
1240	Seq. ID No. 2529	Seq. ID No. 2530
1241c	Seq. ID No. 2535	Seq. ID No. 2536
1243	Seq. ID No. 2537	Seq. ID No. 2538
1244	Seq. ID No. 2539	Seq. ID No. 2540
1245d	Seq. ID No. 2547	Seq. ID No. 2548
1246a	Seq. ID No. 2551	Seq. ID No. 2552

TABLE 19: GENEMARK™ ORFS

ORF Number	DNA SEQ ID Number	Protein SEQ ID Number
1250e	Seq. ID No. 2563	Seq. ID No. 2564
1251a	Seq. ID No. 2565	Seq. ID No. 2566
1253c	Seq. ID No. 2573	Seq. ID No. 2574
1256	Seq. ID No. 2577	Seq. ID No. 2578
1257a	Seq. ID No. 2579	Seq. ID No. 2580
1258b	Seq. ID No. 2585	Seq. ID No. 2586
1263	Seq. ID No. 2593	Seq. ID No. 2594
1265	Seq. ID No. 2595	Seq. ID No. 2596
1266b	Seq. ID No. 2599	Seq. ID No. 2600
1268b	Seq. ID No. 2607	Seq. ID No. 2608
1269	Seq. ID No. 2609	Seq. ID No. 2610
1271	Seq. ID No. 2613	Seq. ID No. 2614
1272a	Seq. ID No. 2615	Seq. ID No. 2616
1273	Seq. ID No. 2619	Seq. ID No. 2620
1275b	Seq. ID No. 2623	Seq. ID No. 2624
1277	Seq. ID No. 2625	Seq. ID No. 2626
1279	Seq. ID No. 2631	Seq. ID No. 2632
1281	Seq. ID No. 2633	Seq. ID No. 2634
1283c	Seq. ID No. 2639	Seq. ID No. 2640
1284	Seq. ID No. 2641	Seq. ID No. 2642
1285a	Seq. ID No. 2643	Seq. ID No. 2644
1287a	Seq. ID No. 2647	Seq. ID No. 2648
1288	Seq. ID No. 2651	Seq. ID No. 2652
1290	Seq. ID No. 2655	Seq. ID No. 2656
1293a	Seq. ID No. 2657	Seq. ID No. 2658
1294a	Seq. ID No. 2661	Seq. ID No. 2662
1297a	Seq. ID No. 2665	Seq. ID No. 2666
1300	Seq. ID No. 2669	Seq. ID No. 2670

TABLE 19: GENEMARK™ ORFs

ORF Number	DNA SEQ ID Number	Protein SEQ ID Number
1302	Seq. ID No. 2671	Seq. ID No. 2672
1305a	Seq. ID No. 2673	Seq. ID No. 2674
1308b	Seq. ID No. 2681	Seq. ID No. 2682
1311	Seq. ID No. 2689	Seq. ID No. 2690
1315	Seq. ID No. 2693	Seq. ID No. 2694
1318	Seq. ID No. 2699	Seq. ID No. 2700
1319b	Seq. ID No. 2703	Seq. ID No. 2704
1320c	Seq. ID No. 2709	Seq. ID No. 2710
1321	Seq. ID No. 2711	Seq. ID No. 2712
1322a	Seq. ID No. 2713	Seq. ID No. 2714
1324	Seq. ID No. 2719	Seq. ID No. 2720
1326a	Seq. ID No. 2721	Seq. ID No. 2722
1333	Seq. ID No. 2727	Seq. ID No. 2728
1337	Seq. ID No. 2737	Seq. ID No. 2738
1340a	Seq. ID No. 2741	Seq. ID No. 2742
1341a	Seq. ID No. 2745	Seq. ID No. 2746
1344a	Seq. ID No. 2749	Seq. ID No. 2750
1348	Seq. ID No. 2753	Seq. ID No. 2754
1349b	Seq. ID No. 2757	Seq. ID No. 2758
1350a	Seq. ID No. 2761	Seq. ID No. 2762
1353	Seq. ID No. 2765	Seq. ID No. 2766
1355	Seq. ID No. 2767	Seq. ID No. 2768
1358a	Seq. ID No. 2769	Seq. ID No. 2770
1359	Seq. ID No. 2773	Seq. ID No. 2774
1361	Seq. ID No. 2775	Seq. ID No. 2776
1364a	Seq. ID No. 2777	Seq. ID No. 2778
1366b	Seq. ID No. 2787	Seq. ID No. 2788
1367	Seq. ID No. 2789	Seq. ID No. 2790

TABLE 19: GENEMARK™ ORFs

ORF Number	DNA SEQ ID Number	Protein SEQ ID Number
1368	Seq. ID No. 2791	Seq. ID No. 2792
1371	Seq. ID No. 2793	Seq. ID No. 2794
1373a	Seq. ID No. 2795	Seq. ID No. 2796
1374	Seq. ID No. 2799	Seq. ID No. 2800
1377	Seq. ID No. 2803	Seq. ID No. 2804
1382	Seq. ID No. 2815	Seq. ID No. 2816
1383	Seq. ID No. 2817	Seq. ID No. 2818
1384a	Seq. ID No. 2819	Seq. ID No. 2820
1386a	Seq. ID No. 2825	Seq. ID No. 2826
1394	Seq. ID No. 2843	Seq. ID No. 2844
1396	Seq. ID No. 2847	Seq. ID No. 2848
1397	Seq. ID No. 2849	Seq. ID No. 2850
1398	Seq. ID No. 2851	Seq. ID No. 2852
1400	Seq. ID No. 2857	Seq. ID No. 2858
1401	Seq. ID No. 2859	Seq. ID No. 2860
1405	Seq. ID No. 2863	Seq. ID No. 2864
1408	Seq. ID No. 2867	Seq. ID No. 2868
1409	Seq. ID No. 2869	Seq. ID No. 2870
1410	Seq. ID No. 2871	Seq. ID No. 2872
1411c	Seq. ID No. 2877	Seq. ID No. 2878
1412a	Seq. ID No. 2879	Seq. ID No. 2880
1415	Seq. ID No. 2889	Seq. ID No. 2890
1416	Seq. ID No. 2891	Seq. ID No. 2892
1420a	Seq. ID No. 2897	Seq. ID No. 2898
1422	Seq. ID No. 2901	Seq. ID No. 2902
1423	Seq. ID No. 2903	Seq. ID No. 2904
1426b	Seq. ID No. 2907	Seq. ID No. 2908
1427a	Seq. ID No. 2909	Seq. ID No. 2910

TABLE 19: GENEMARK™ ORFS

ORF Number	DNA SEQ ID Number	Protein SEQ ID Number
1428	Seq. ID No. 2913	Seq. ID No. 2914
1429a	Seq. ID No. 2915	Seq. ID No. 2916
1431	Seq. ID No. 2919	Seq. ID No. 2920
1432	Seq. ID No. 2921	Seq. ID No. 2922
1433	Seq. ID No. 2923	Seq. ID No. 2924
1434a	Seq. ID No. 2925	Seq. ID No. 2926
1437a	Seq. ID No. 2929	Seq. ID No. 2930
1438	Seq. ID No. 2935	Seq. ID No. 2936
1439d	Seq. ID No. 2943	Seq. ID No. 2944
1440c	Seq. ID No. 2951	Seq. ID No. 2952
1442a	Seq. ID No. 2955	Seq. ID No. 2956
1445c	Seq. ID No. 2963	Seq. ID No. 2964
1446a	Seq. ID No. 2965	Seq. ID No. 2966
1447b	Seq. ID No. 2971	Seq. ID No. 2972
1448	Seq. ID No. 2973	Seq. ID No. 2974
1449a	Seq. ID No. 2975	Seq. ID No. 2976
1451	Seq. ID No. 2979	Seq. ID No. 2980
1452a	Seq. ID No. 2981	Seq. ID No. 2982
1453	Seq. ID No. 2985	Seq. ID No. 2986
1455a	Seq. ID No. 2989	Seq. ID No. 2990
1456	Seq. ID No. 2993	Seq. ID No. 2994
1457c	Seq. ID No. 2999	Seq. ID No. 3000
1459	Seq. ID No. 3001	Seq. ID No. 3002
1462a	Seq. ID No. 3003	Seq. ID No. 3004
1466c	Seq. ID No. 3017	Seq. ID No. 3018
1469c	Seq. ID No. 3027	Seq. ID No. 3028
1470c	Seq. ID No. 3033	Seq. ID No. 3034
1471	Seq. ID No. 3035	Seq. ID No. 3036

TABLE 19: GENEMARK™ ORFS

ORF Number	DNA SEQ ID Number	Protein SEQ ID Number
1472c	Seq. ID No. 3039	Seq. ID No. 3040
1474	Seq. ID No. 3041	Seq. ID No. 3042
1475	Seq. ID No. 3043	Seq. ID No. 3044
1476	Seq. ID No. 3045	Seq. ID No. 3046
1477a	Seq. ID No. 3047	Seq. ID No. 3048
1479c	Seq. ID No. 3055	Seq. ID No. 3056
1482a	Seq. ID No. 3057	Seq. ID No. 3058
1483	Seq. ID No. 3061	Seq. ID No. 3062
1484b	Seq. ID No. 3065	Seq. ID No. 3066
1486	Seq. ID No. 3069	Seq. ID No. 3070
1488d	Seq. ID No. 3079	Seq. ID No. 3080
1490	Seq. ID No. 3089	Seq. ID No. 3090
1494	Seq. ID No. 3091	Seq. ID No. 3092
1497	Seq. ID No. 3093	Seq. ID No. 3094
1498a	Seq. ID No. 3095	Seq. ID No. 3096
1499	Seq. ID No. 3103	Seq. ID No. 3104
1502a	Seq. ID No. 3105	Seq. ID No. 3106
1503a	Seq. ID No. 3109	Seq. ID No. 3110
1506a	Seq. ID No. 3113	Seq. ID No. 3114
1508	Seq. ID No. 3125	Seq. ID No. 3126
1510a	Seq. ID No. 3127	Seq. ID No. 3128
1511	Seq. ID No. 3135	Seq. ID No. 3136
1512	Seq. ID No. 3137	Seq. ID No. 3138
1513b	Seq. ID No. 3141	Seq. ID No. 3142
1516	Seq. ID No. 3143	Seq. ID No. 3144
1517b	Seq. ID No. 3147	Seq. ID No. 3148
1520	Seq. ID No. 3155	Seq. ID No. 3156
1522	Seq. ID No. 3157	Seq. ID No. 3158

TABLE 19: GENEMARK™ ORFS

ORF Number	DNA SEQ ID Number	Protein SEQ ID Number
1523	Seq. ID No. 3159	Seq. ID No. 3160
1528	Seq. ID No. 3161	Seq. ID No. 3162
1530b	Seq. ID No. 3165	Seq. ID No. 3166
1534a	Seq. ID No. 3169	Seq. ID No. 3170
1536a	Seq. ID No. 3175	Seq. ID No. 3176
1537	Seq. ID No. 3179	Seq. ID No. 3180
1543	Seq. ID No. 3183	Seq. ID No. 3184
1544	Seq. ID No. 3185	Seq. ID No. 3186
1547b	Seq. ID No. 3189	Seq. ID No. 3190
1548	Seq. ID No. 3191	Seq. ID No. 3192
1553a	Seq. ID No. 3195	Seq. ID No. 3196
1554a	Seq. ID No. 3199	Seq. ID No. 3200
1555	Seq. ID No. 3205	Seq. ID No. 3206
1556c	Seq. ID No. 3211	Seq. ID No. 3212
1557c	Seq. ID No. 3217	Seq. ID No. 3218
1559b	Seq. ID No. 3221	Seq. ID No. 3222
1564a	Seq. ID No. 3225	Seq. ID No. 3226
1565	Seq. ID No. 3229	Seq. ID No. 3230
1567	Seq. ID No. 3231	Seq. ID No. 3232
1570	Seq. ID No. 3237	Seq. ID No. 3238
1571	Seq. ID No. 3239	Seq. ID No. 3240
1572d	Seq. ID No. 3247	Seq. ID No. 3248
1573	Seq. ID No. 3251	Seq. ID No. 3252
1576	Seq. ID No. 3253	Seq. ID No. 3254
1577a	Seq. ID No. 3255	Seq. ID No. 3256
1578	Seq. ID No. 3259	Seq. ID No. 3260
1580a	Seq. ID No. 3261	Seq. ID No. 3262
1582a	Seq. ID No. 3267	Seq. ID No. 3268

TABLE 19: GENEMARK™ ORFS

ORF Number	DNA SEQ ID Number	Protein SEQ ID Number
1584	Seq. ID No. 3273	Seq. ID No. 3274
1585b	Seq. ID No. 3277	Seq. ID No. 3278
1587a	Seq. ID No. 3279	Seq. ID No. 3280
1588	Seq. ID No. 3285	Seq. ID No. 3286
1590	Seq. ID No. 3287	Seq. ID No. 3288
1591	Seq. ID No. 3289	Seq. ID No. 3290
1592b	Seq. ID No. 3293	Seq. ID No. 3294
1593	Seq. ID No. 3295	Seq. ID No. 3296
1594b	Seq. ID No. 3299	Seq. ID No. 3300
1595a	Seq. ID No. 3301	Seq. ID No. 3302
1598a	Seq. ID No. 3305	Seq. ID No. 3306
1600a	Seq. ID No. 3309	Seq. ID No. 3310
1602	Seq. ID No. 3315	Seq. ID No. 3316
1606b	Seq. ID No. 3319	Seq. ID No. 3320
1607a	Seq. ID No. 3321	Seq. ID No. 3322
1610a	Seq. ID No. 3327	Seq. ID No. 3328
1616a	Seq. ID No. 3333	Seq. ID No. 3334
1619	Seq. ID No. 3337	Seq. ID No. 3338
1623a	Seq. ID No. 3343	Seq. ID No. 3344
1625b	Seq. ID No. 3353	Seq. ID No. 3354
1626b	Seq. ID No. 3359	Seq. ID No. 3360
1628a	Seq. ID No. 3361	Seq. ID No. 3362
1632a	Seq. ID No. 3365	Seq. ID No. 3366
1634a	Seq. ID No. 3373	Seq. ID No. 3374
1642a	Seq. ID No. 3381	Seq. ID No. 3382
1643a	Seq. ID No. 3385	Seq. ID No. 3386
1646c	Seq. ID No. 3393	Seq. ID No. 3394
1647	Seq. ID No. 3401	Seq. ID No. 3402

TABLE 19: GENEMARK™ ORFS

ORF Number	DNA SEQ ID Number	Protein SEQ ID Number
1649b	Seq. ID No. 3407	Seq. ID No. 3408
1652a	Seq. ID No. 3411	Seq. ID No. 3412
1654	Seq. ID No. 3415	Seq. ID No. 3416
1656b	Seq. ID No. 3417	Seq. ID No. 3418
1659b	Seq. ID No. 3423	Seq. ID No. 3424
1662a	Seq. ID No. 3429	Seq. ID No. 3430
1665a	Seq. ID No. 3437	Seq. ID No. 3438
1668	Seq. ID No. 3439	Seq. ID No. 3440
1670a	Seq. ID No. 3443	Seq. ID No. 3444
1673f	Seq. ID No. 3459	Seq. ID No. 3460
1674	Seq. ID No. 3461	Seq. ID No. 3462
1675b	Seq. ID No. 3465	Seq. ID No. 3466
1676	Seq. ID No. 3469	Seq. ID No. 3470
1677	Seq. ID No. 3471	Seq. ID No. 3472
1679	Seq. ID No. 3473	Seq. ID No. 3474
1680	Seq. ID No. 3475	Seq. ID No. 3476
1682a	Seq. ID No. 3477	Seq. ID No. 3478
1683b	Seq. ID No. 3483	Seq. ID No. 3484
1685	Seq. ID No. 3487	Seq. ID No. 3488
1688c	Seq. ID No. 3495	Seq. ID No. 3496
1689a	Seq. ID No. 3497	Seq. ID No. 3498
1690b	Seq. ID No. 3505	Seq. ID No. 3506
1691	Seq. ID No. 3507	Seq. ID No. 3508
1692	Seq. ID No. 3509	Seq. ID No. 3510
1693	Seq. ID No. 3511	Seq. ID No. 3512
1694b	Seq. ID No. 3515	Seq. ID No. 3516
1696	Seq. ID No. 3521	Seq. ID No. 3522
1697a	Seq. ID No. 3523	Seq. ID No. 3524

TABLE 19: GENEMARK™ ORFS

ORF Number	DNA SEQ ID Number	Protein SEQ ID Number
1699b	Seq. ID No. 3529	Seq. ID No. 3530
1701a	Seq. ID No. 3535	Seq. ID No. 3536
1704a	Seq. ID No. 3541	Seq. ID No. 3542
1707a	Seq. ID No. 3551	Seq. ID No. 3552
1710a	Seq. ID No. 3559	Seq. ID No. 3560
1712a	Seq. ID No. 3563	Seq. ID No. 3564
1715a	Seq. ID No. 3567	Seq. ID No. 3568
1722	Seq. ID No. 3575	Seq. ID No. 3576
1723a	Seq. ID No. 3577	Seq. ID No. 3578
1727	Seq. ID No. 3583	Seq. ID No. 3584
1728	Seq. ID No. 3585	Seq. ID No. 3586
1733	Seq. ID No. 3589	Seq. ID No. 3590
1734	Seq. ID No. 3591	Seq. ID No. 3592
1737b	Seq. ID No. 3599	Seq. ID No. 3600
1738a	Seq. ID No. 3601	Seq. ID No. 3602
1739	Seq. ID No. 3607	Seq. ID No. 3608
1741	Seq. ID No. 3609	Seq. ID No. 3610
1743	Seq. ID No. 3611	Seq. ID No. 3612
1744b	Seq. ID No. 3615	Seq. ID No. 3616
1747	Seq. ID No. 3619	Seq. ID No. 3620
1752b	Seq. ID No. 3629	Seq. ID No. 3630
1753	Seq. ID No. 3631	Seq. ID No. 3632
1756a	Seq. ID No. 3633	Seq. ID No. 3634
1757a	Seq. ID No. 3637	Seq. ID No. 3638
1759	Seq. ID No. 3641	Seq. ID No. 3642
1760	Seq. ID No. 3643	Seq. ID No. 3644
1762	Seq. ID No. 3645	Seq. ID No. 3646
1764c	Seq. ID No. 3651	Seq. ID No. 3652

TABLE 19: GENEMARK™ ORFs

ORF Number	DNA SEQ ID Number	Protein SEQ ID Number
1765	Seq. ID No. 3653	Seq. ID No. 3654
1766	Seq. ID No. 3655	Seq. ID No. 3656
1769a	Seq. ID No. 3661	Seq. ID No. 3662
1771	Seq. ID No. 3665	Seq. ID No. 3666
1773	Seq. ID No. 3667	Seq. ID No. 3668
1774	Seq. ID No. 3669	Seq. ID No. 3670
1775c	Seq. ID No. 3675	Seq. ID No. 3676
1780	Seq. ID No. 3681	Seq. ID No. 3682
1784b	Seq. ID No. 3689	Seq. ID No. 3690
1788c	Seq. ID No. 3695	Seq. ID No. 3696
1789a	Seq. ID No. 3697	Seq. ID No. 3698
1792a	Seq. ID No. 3705	Seq. ID No. 3706
1793a	Seq. ID No. 3711	Seq. ID No. 3712
1797a	Seq. ID No. 3719	Seq. ID No. 3720
1798b	Seq. ID No. 3725	Seq. ID No. 3726
1800	Seq. ID No. 3729	Seq. ID No. 3730
1802a	Seq. ID No. 3731	Seq. ID No. 3732
1803	Seq. ID No. 3735	Seq. ID No. 3736
1804b	Seq. ID No. 3739	Seq. ID No. 3740
1805	Seq. ID No. 3741	Seq. ID No. 3742
1806a	Seq. ID No. 3743	Seq. ID No. 3744
1807a	Seq. ID No. 3749	Seq. ID No. 3750
1808d	Seq. ID No. 3759	Seq. ID No. 3760
1809e	Seq. ID No. 3769	Seq. ID No. 3770
1810a	Seq. ID No. 3773	Seq. ID No. 3774
1811a	Seq. ID No. 3777	Seq. ID No. 3778
1812a	Seq. ID No. 3781	Seq. ID No. 3782
1815a	Seq. ID No. 3787	Seq. ID No. 3788

TABLE 19: GENEMARK™ ORFS

ORF Number	DNA SEQ ID Number	Protein SEQ ID Number
1816b	Seq. ID No. 3795	Seq. ID No. 3796
1819a	Seq. ID No. 3801	Seq. ID No. 3802
1821	Seq. ID No. 3805	Seq. ID No. 3806
1823a	Seq. ID No. 3809	Seq. ID No. 3810
1825	Seq. ID No. 3813	Seq. ID No. 3814
1828	Seq. ID No. 3819	Seq. ID No. 3820
1830a	Seq. ID No. 3821	Seq. ID No. 3822
1833	Seq. ID No. 3825	Seq. ID No. 3826
1834	Seq. ID No. 3827	Seq. ID No. 3828
1835	Seq. ID No. 3829	Seq. ID No. 3830
1836a	Seq. ID No. 3831	Seq. ID No. 3832
1837	Seq. ID No. 3835	Seq. ID No. 3836
1838c	Seq. ID No. 3841	Seq. ID No. 3842
1839a	Seq. ID No. 3845	Seq. ID No. 3846
1842d	Seq. ID No. 3855	Seq. ID No. 3856
1843	Seq. ID No. 3857	Seq. ID No. 3858
1845c	Seq. ID No. 3863	Seq. ID No. 3864
1848b	Seq. ID No. 3867	Seq. ID No. 3868
1850a	Seq. ID No. 3869	Seq. ID No. 3870
1853a	Seq. ID No. 3875	Seq. ID No. 3876
1854b	Seq. ID No. 3881	Seq. ID No. 3882
1855	Seq. ID No. 3883	Seq. ID No. 3884
1856	Seq. ID No. 3885	Seq. ID No. 3886
1857a	Seq. ID No. 3887	Seq. ID No. 3888
1859	Seq. ID No. 3897	Seq. ID No. 3898
1861b	Seq. ID No. 3901	Seq. ID No. 3902
1863a	Seq. ID No. 3905	Seq. ID No. 3906
1864a	Seq. ID No. 3909	Seq. ID No. 3910

TABLE 19: GENEMARK™ ORFs

ORF Number	DNA SEQ ID Number	Protein SEQ ID Number
1865b	Seq. ID No. 3913	Seq. ID No. 3914
1868	Seq. ID No. 3915	Seq. ID No. 3916
1869	Seq. ID No. 3917	Seq. ID No. 3918
1870	Seq. ID No. 3919	Seq. ID No. 3920
1873a	Seq. ID No. 3921	Seq. ID No. 3922
1875c	Seq. ID No. 3929	Seq. ID No. 3930
1877a	Seq. ID No. 3931	Seq. ID No. 3932
1878	Seq. ID No. 3935	Seq. ID No. 3936
1884	Seq. ID No. 3941	Seq. ID No. 3942
1886	Seq. ID No. 3943	Seq. ID No. 3944
1887	Seq. ID No. 3945	Seq. ID No. 3946
1888a	Seq. ID No. 3947	Seq. ID No. 3948
1890	Seq. ID No. 3951	Seq. ID No. 3952
1891a	Seq. ID No. 3953	Seq. ID No. 3954
1893	Seq. ID No. 3957	Seq. ID No. 3958
1897c	Seq. ID No. 3971	Seq. ID No. 3972
1899	Seq. ID No. 3977	Seq. ID No. 3978
1902a	Seq. ID No. 3981	Seq. ID No. 3982
1907	Seq. ID No. 3985	Seq. ID No. 3986
1912	Seq. ID No. 3987	Seq. ID No. 3988
1915a	Seq. ID No. 3989	Seq. ID No. 3990
1916	Seq. ID No. 3993	Seq. ID No. 3994
1918c	Seq. ID No. 4001	Seq. ID No. 4002
1919a	Seq. ID No. 4005	Seq. ID No. 4006
1923a	Seq. ID No. 4011	Seq. ID No. 4012
1925	Seq. ID No. 4015	Seq. ID No. 4016
1926	Seq. ID No. 4017	Seq. ID No. 4018
1927a	Seq. ID No. 4019	Seq. ID No. 4020

TABLE 19: GENEMARK™ ORFS

ORF Number	DNA SEQ ID Number	Protein SEQ ID Number
1930	Seq. ID No. 4023	Seq. ID No. 4024
1931c	Seq. ID No. 4029	Seq. ID No. 4030
1932	Seq. ID No. 4031	Seq. ID No. 4032
1933a	Seq. ID No. 4033	Seq. ID No. 4034
1934	Seq. ID No. 4037	Seq. ID No. 4038
1936	Seq. ID No. 4039	Seq. ID No. 4040
1937e	Seq. ID No. 4049	Seq. ID No. 4050
1939a	Seq. ID No. 4051	Seq. ID No. 4052
1940	Seq. ID No. 4057	Seq. ID No. 4058
1941a	Seq. ID No. 4059	Seq. ID No. 4060
1943a	Seq. ID No. 4065	Seq. ID No. 4066
1944	Seq. ID No. 4069	Seq. ID No. 4070
1946c	Seq. ID No. 4075	Seq. ID No. 4076
1950	Seq. ID No. 4079	Seq. ID No. 4080
1951c	Seq. ID No. 4085	Seq. ID No. 4086
1953	Seq. ID No. 4089	Seq. ID No. 4090
1954c	Seq. ID No. 4095	Seq. ID No. 4096
1956	Seq. ID No. 4097	Seq. ID No. 4098
1957	Seq. ID No. 4099	Seq. ID No. 4100
1958c	Seq. ID No. 4105	Seq. ID No. 4106
1960c	Seq. ID No. 4111	Seq. ID No. 4112
1962a	Seq. ID No. 4115	Seq. ID No. 4116
1965b	Seq. ID No. 4121	Seq. ID No. 4122
1966	Seq. ID No. 4123	Seq. ID No. 4124
1968	Seq. ID No. 4127	Seq. ID No. 4128
1969	Seq. ID No. 4129	Seq. ID No. 4130
1970a	Seq. ID No. 4131	Seq. ID No. 4132
1973	Seq. ID No. 4137	Seq. ID No. 4138

TABLE 19: GENEMARK™ ORFs

ORF Number	DNA SEQ ID Number	Protein SEQ ID Number
1977a	Seq. ID No. 4141	Seq. ID No. 4142
1979a	Seq. ID No. 4147	Seq. ID No. 4148
1982	Seq. ID No. 4157	Seq. ID No. 4158
1985a	Seq. ID No. 4159	Seq. ID No. 4160
1986	Seq. ID No. 4163	Seq. ID No. 4164
1987a	Seq. ID No. 4165	Seq. ID No. 4166
1989a	Seq. ID No. 4169	Seq. ID No. 4170
1990c	Seq. ID No. 4179	Seq. ID No. 4180
1992a	Seq. ID No. 4183	Seq. ID No. 4184
1993a	Seq. ID No. 4187	Seq. ID No. 4188
1996	Seq. ID No. 4193	Seq. ID No. 4194
2000	Seq. ID No. 4195	Seq. ID No. 4196
2001	Seq. ID No. 4197	Seq. ID No. 4198
2003	Seq. ID No. 4199	Seq. ID No. 4200
2006	Seq. ID No. 4201	Seq. ID No. 4202
2010	Seq. ID No. 4205	Seq. ID No. 4206
2011a	Seq. ID No. 4207	Seq. ID No. 4208
2013a	Seq. ID No. 4213	Seq. ID No. 4214
2015	Seq. ID No. 4219	Seq. ID No. 4220
2016h	Seq. ID No. 4235	Seq. ID No. 4236
2020	Seq. ID No. 4237	Seq. ID No. 4238
2021	Seq. ID No. 4239	Seq. ID No. 4240
2023b	Seq. ID No. 4243	Seq. ID No. 4244
2024a	Seq. ID No. 4245	Seq. ID No. 4246
2027	Seq. ID No. 4255	Seq. ID No. 4256
2030b	Seq. ID No. 4259	Seq. ID No. 4260
2033	Seq. ID No. 4267	Seq. ID No. 4268
2036	Seq. ID No. 4271	Seq. ID No. 4272

TABLE 19: GENEMARK™ ORFs

ORF Number	DNA SEQ ID Number	Protein SEQ ID Number
2040a	Seq. ID No. 4277	Seq. ID No. 4278
2042	Seq. ID No. 4279	Seq. ID No. 4280
2043b	Seq. ID No. 4281	Seq. ID No. 4282
2044	Seq. ID No. 4283	Seq. ID No. 4284
2046a	Seq. ID No. 4289	Seq. ID No. 4290
2047a	Seq. ID No. 4293	Seq. ID No. 4294
2050	Seq. ID No. 4299	Seq. ID No. 4300
2053	Seq. ID No. 4301	Seq. ID No. 4302
2054	Seq. ID No. 4303	Seq. ID No. 4304
2055	Seq. ID No. 4305	Seq. ID No. 4306
2056	Seq. ID No. 4307	Seq. ID No. 4308
2057	Seq. ID No. 4309	Seq. ID No. 4310
2059b	Seq. ID No. 4313	Seq. ID No. 4314
2060a	Seq. ID No. 4315	Seq. ID No. 4316
2062c	Seq. ID No. 4323	Seq. ID No. 4324
2064	Seq. ID No. 4325	Seq. ID No. 4326
2065a	Seq. ID No. 4327	Seq. ID No. 4328
2066	Seq. ID No. 4331	Seq. ID No. 4332
2068	Seq. ID No. 4333	Seq. ID No. 4334
2069b	Seq. ID No. 4337	Seq. ID No. 4338
2074a	Seq. ID No. 4341	Seq. ID No. 4342
2075a	Seq. ID No. 4345	Seq. ID No. 4346
2076a	Seq. ID No. 4349	Seq. ID No. 4350
2078	Seq. ID No. 4355	Seq. ID No. 4356
2079a	Seq. ID No. 4357	Seq. ID No. 4358
2081b	Seq. ID No. 4365	Seq. ID No. 4366
2086a	Seq. ID No. 4367	Seq. ID No. 4368
2087a	Seq. ID No. 4371	Seq. ID No. 4372

TABLE 19: GENEMARK™ ORFs

ORF Number	DNA SEQ ID Number	Protein SEQ ID Number
2088	Seq. ID No. 4375	Seq. ID No. 4376
2091	Seq. ID No. 4377	Seq. ID No. 4378
2092	Seq. ID No. 4379	Seq. ID No. 4380
2094	Seq. ID No. 4383	Seq. ID No. 4384
2096b	Seq. ID No. 4387	Seq. ID No. 4388
2097	Seq. ID No. 4393	Seq. ID No. 4394
2100	Seq. ID No. 4397	Seq. ID No. 4398
2104	Seq. ID No. 4401	Seq. ID No. 4402
2109a	Seq. ID No. 4409	Seq. ID No. 4410
2110a	Seq. ID No. 4413	Seq. ID No. 4414
2112b	Seq. ID No. 4421	Seq. ID No. 4422
2116	Seq. ID No. 4433	Seq. ID No. 4434
2117	Seq. ID No. 4435	Seq. ID No. 4436
2124a	Seq. ID No. 4445	Seq. ID No. 4446
2125a	Seq. ID No. 4449	Seq. ID No. 4450
2128a	Seq. ID No. 4457	Seq. ID No. 4458
2133	Seq. ID No. 4461	Seq. ID No. 4462
2138a	Seq. ID No. 4463	Seq. ID No. 4464
2140b	Seq. ID No. 4471	Seq. ID No. 4472
2142b	Seq. ID No. 4475	Seq. ID No. 4476
2144a	Seq. ID No. 4477	Seq. ID No. 4478
2146	Seq. ID No. 4481	Seq. ID No. 4482
2147c	Seq. ID No. 4487	Seq. ID No. 4488
2149b	Seq. ID No. 4491	Seq. ID No. 4492
2152a	Seq. ID No. 4499	Seq. ID No. 4500
2153	Seq. ID No. 4501	Seq. ID No. 4502
2155a	Seq. ID No. 4503	Seq. ID No. 4504
2156b	Seq. ID No. 4509	Seq. ID No. 4510

TABLE 19: GENEMARK™ ORFS

ORF Number	DNA SEQ ID Number	Protein SEQ ID Number
2160a	Seq. ID No. 4517	Seq. ID No. 4518
2164	Seq. ID No. 4531	Seq. ID No. 4532
2165	Seq. ID No. 4533	Seq. ID No. 4534
2166a	Seq. ID No. 4535	Seq. ID No. 4536
2169	Seq. ID No. 4539	Seq. ID No. 4540
2171	Seq. ID No. 4541	Seq. ID No. 4542
2173a	Seq. ID No. 4545	Seq. ID No. 4546
2174	Seq. ID No. 4549	Seq. ID No. 4550
2176c	Seq. ID No. 4557	Seq. ID No. 4558
2179a	Seq. ID No. 4563	Seq. ID No. 4564
2180	Seq. ID No. 4567	Seq. ID No. 4568
2181a	Seq. ID No. 4569	Seq. ID No. 4570
2183	Seq. ID No. 4575	Seq. ID No. 4576
2185	Seq. ID No. 4577	Seq. ID No. 4578
2186a	Seq. ID No. 4579	Seq. ID No. 4580
2189a	Seq. ID No. 4583	Seq. ID No. 4584
2193	Seq. ID No. 4591	Seq. ID No. 4592
2194a	Seq. ID No. 4593	Seq. ID No. 4594
2196	Seq. ID No. 4597	Seq. ID No. 4598
2197b	Seq. ID No. 4601	Seq. ID No. 4602
2201a	Seq. ID No. 4605	Seq. ID No. 4606
2203	Seq. ID No. 4609	Seq. ID No. 4610
2204	Seq. ID No. 4611	Seq. ID No. 4612
2206a	Seq. ID No. 4613	Seq. ID No. 4614
2209	Seq. ID No. 4623	Seq. ID No. 4624
2212a	Seq. ID No. 4625	Seq. ID No. 4626
2215a	Seq. ID No. 4629	Seq. ID No. 4630
2216a	Seq. ID No. 4633	Seq. ID No. 4634

TABLE 19: GENEMARK™ ORFS

ORF Number	DNA SEQ ID Number	Protein SEQ ID Number
2218	Seq. ID No. 4637	Seq. ID No. 4638
2219b	Seq. ID No. 4641	Seq. ID No. 4642
2220a	Seq. ID No. 4645	Seq. ID No. 4646
2221	Seq. ID No. 4651	Seq. ID No. 4652
2222	Seq. ID No. 4653	Seq. ID No. 4654
2223a	Seq. ID No. 4655	Seq. ID No. 4656
2226	Seq. ID No. 4661	Seq. ID No. 4662
2227	Seq. ID No. 4663	Seq. ID No. 4664
2228c	Seq. ID No. 4669	Seq. ID No. 4670
2231	Seq. ID No. 4671	Seq. ID No. 4672
2232	Seq. ID No. 4673	Seq. ID No. 4674
2234a	Seq. ID No. 4675	Seq. ID No. 4676
2238	Seq. ID No. 4685	Seq. ID No. 4686
2240a	Seq. ID No. 4689	Seq. ID No. 4690
2244	Seq. ID No. 4697	Seq. ID No. 4698
2248	Seq. ID No. 4703	Seq. ID No. 4704
2249	Seq. ID No. 4705	Seq. ID No. 4706
2253d	Seq. ID No. 4713	Seq. ID No. 4714
2255b	Seq. ID No. 4717	Seq. ID No. 4718
2256	Seq. ID No. 4719	Seq. ID No. 4720
2259a	Seq. ID No. 4723	Seq. ID No. 4724
2260c	Seq. ID No. 4729	Seq. ID No. 4730
2262	Seq. ID No. 4731	Seq. ID No. 4732
2263	Seq. ID No. 4733	Seq. ID No. 4734
2267	Seq. ID No. 4739	Seq. ID No. 4740
2269	Seq. ID No. 4743	Seq. ID No. 4744
2270	Seq. ID No. 4745	Seq. ID No. 4746
2272	Seq. ID No. 4747	Seq. ID No. 4748

TABLE 19: GENEMARK™ ORFS

ORF Number	DNA SEQ ID Number	Protein SEQ ID Number
2273	Seq. ID No. 4749	Seq. ID No. 4750
2274	Seq. ID No. 4751	Seq. ID No. 4752
2275a	Seq. ID No. 4753	Seq. ID No. 4754
2276b	Seq. ID No. 4761	Seq. ID No. 4762
2277a	Seq. ID No. 4767	Seq. ID No. 4768
2278a	Seq. ID No. 4771	Seq. ID No. 4772
2280	Seq. ID No. 4779	Seq. ID No. 4780
2284	Seq. ID No. 4781	Seq. ID No. 4782
2285	Seq. ID No. 4783	Seq. ID No. 4784
2286a	Seq. ID No. 4785	Seq. ID No. 4786
2288	Seq. ID No. 4789	Seq. ID No. 4790
2290	Seq. ID No. 4791	Seq. ID No. 4792
2291a	Seq. ID No. 4793	Seq. ID No. 4794
2292a	Seq. ID No. 4799	Seq. ID No. 4800
2297	Seq. ID No. 4807	Seq. ID No. 4808
2298	Seq. ID No. 4809	Seq. ID No. 4810
2299	Seq. ID No. 4811	Seq. ID No. 4812
2300	Seq. ID No. 4813	Seq. ID No. 4814
2301	Seq. ID No. 4815	Seq. ID No. 4816
2304	Seq. ID No. 4821	Seq. ID No. 4822
2307	Seq. ID No. 4825	Seq. ID No. 4826
2308	Seq. ID No. 4827	Seq. ID No. 4828
2309a	Seq. ID No. 4829	Seq. ID No. 4830
2311	Seq. ID No. 4837	Seq. ID No. 4838
2312a	Seq. ID No. 4839	Seq. ID No. 4840
2314	Seq. ID No. 4845	Seq. ID No. 4846
2315	Seq. ID No. 4847	Seq. ID No. 4848
2316	Seq. ID No. 4849	Seq. ID No. 4850

TABLE 19: GENEMARK™ ORFS

ORF Number	DNA SEQ ID Number	Protein SEQ ID Number
2321b	Seq. ID No. 4857	Seq. ID No. 4858
2322	Seq. ID No. 4861	Seq. ID No. 4862
2327	Seq. ID No. 4865	Seq. ID No. 4866
2328	Seq. ID No. 4867	Seq. ID No. 4868
2329d	Seq. ID No. 4875	Seq. ID No. 4876
2331	Seq. ID No. 4879	Seq. ID No. 4880
2333	Seq. ID No. 4881	Seq. ID No. 4882
2335	Seq. ID No. 4883	Seq. ID No. 4884
2336	Seq. ID No. 4885	Seq. ID No. 4886
2337b	Seq. ID No. 4887	Seq. ID No. 4888
2338c	Seq. ID No. 4893	Seq. ID No. 4894
2342c	Seq. ID No. 4899	Seq. ID No. 4900
2344	Seq. ID No. 4901	Seq. ID No. 4902
2345	Seq. ID No. 4903	Seq. ID No. 4904
2347	Seq. ID No. 4905	Seq. ID No. 4906
2348	Seq. ID No. 4907	Seq. ID No. 4908
2349a	Seq. ID No. 4909	Seq. ID No. 4910
2353	Seq. ID No. 4915	Seq. ID No. 4916
2354	Seq. ID No. 4917	Seq. ID No. 4918
2357	Seq. ID No. 4919	Seq. ID No. 4920
2358	Seq. ID No. 4921	Seq. ID No. 4922
2361a	Seq. ID No. 4925	Seq. ID No. 4926
2363a	Seq. ID No. 4929	Seq. ID No. 4930
2365a	Seq. ID No. 4933	Seq. ID No. 4934
2366a	Seq. ID No. 4937	Seq. ID No. 4938
2367	Seq. ID No. 4941	Seq. ID No. 4942
2368	Seq. ID No. 4943	Seq. ID No. 4944
2369	Seq. ID No. 4945	Seq. ID No. 4946

TABLE 19: GENEMARK™ ORFS

ORF Number	DNA SEQ ID Number	Protein SEQ ID Number
2370	Seq. ID No. 4947	Seq. ID No. 4948
2373	Seq. ID No. 4953	Seq. ID No. 4954
2374a	Seq. ID No. 4955	Seq. ID No. 4956
2376	Seq. ID No. 4959	Seq. ID No. 4960
2377a	Seq. ID No. 4961	Seq. ID No. 4962
2378	Seq. ID No. 4965	Seq. ID No. 4966
2379a	Seq. ID No. 4967	Seq. ID No. 4968
2380	Seq. ID No. 4971	Seq. ID No. 4972
2381	Seq. ID No. 4973	Seq. ID No. 4974
2384a	Seq. ID No. 4977	Seq. ID No. 4978
2387	Seq. ID No. 4985	Seq. ID No. 4986
2391	Seq. ID No. 4989	Seq. ID No. 4990
2392	Seq. ID No. 4991	Seq. ID No. 4992
2395	Seq. ID No. 4995	Seq. ID No. 4996
2396	Seq. ID No. 4997	Seq. ID No. 4998
2399b	Seq. ID No. 5005	Seq. ID No. 5006
2401	Seq. ID No. 5009	Seq. ID No. 5010
2403a	Seq. ID No. 5015	Seq. ID No. 5016
2404a	Seq. ID No. 5019	Seq. ID No. 5020
2409a	Seq. ID No. 5025	Seq. ID No. 5026
2410	Seq. ID No. 5029	Seq. ID No. 5030
2415a	Seq. ID No. 5037	Seq. ID No. 5038
2417a	Seq. ID No. 5045	Seq. ID No. 5046
2418a	Seq. ID No. 5049	Seq. ID No. 5050
2420	Seq. ID No. 5053	Seq. ID No. 5054
2421	Seq. ID No. 5055	Seq. ID No. 5056
2422c	Seq. ID No. 5059	Seq. ID No. 5060
2423a	Seq. ID No. 5061	Seq. ID No. 5062

TABLE 19: GENEMARK™ ORFS

ORF Number	DNA SEQ ID Number	Protein SEQ ID Number
2424a	Seq. ID No. 5065	Seq. ID No. 5066
2426	Seq. ID No. 5071	Seq. ID No. 5072
2428a	Seq. ID No. 5073	Seq. ID No. 5074
2429	Seq. ID No. 5079	Seq. ID No. 5080
2432	Seq. ID No. 5081	Seq. ID No. 5082
2433	Seq. ID No. 5083	Seq. ID No. 5084
2440	Seq. ID No. 5087	Seq. ID No. 5088
2442a	Seq. ID No. 5089	Seq. ID No. 5090
2443	Seq. ID No. 5093	Seq. ID No. 5094
2444a	Seq. ID No. 5095	Seq. ID No. 5096
2445	Seq. ID No. 5103	Seq. ID No. 5104
2448b	Seq. ID No. 5105	Seq. ID No. 5106
2449a	Seq. ID No. 5107	Seq. ID No. 5108
2451	Seq. ID No. 5111	Seq. ID No. 5112
2452	Seq. ID No. 5113	Seq. ID No. 5114
2453	Seq. ID No. 5115	Seq. ID No. 5116
2455	Seq. ID No. 5117	Seq. ID No. 5118
2456a	Seq. ID No. 5119	Seq. ID No. 5120
2458g	Seq. ID No. 5141	Seq. ID No. 5142
2461a	Seq. ID No. 5143	Seq. ID No. 5144
2462a	Seq. ID No. 5147	Seq. ID No. 5148
2464	Seq. ID No. 5153	Seq. ID No. 5154
2465a	Seq. ID No. 5155	Seq. ID No. 5156
2469a	Seq. ID No. 5163	Seq. ID No. 5164
2471	Seq. ID No. 5169	Seq. ID No. 5170
2473	Seq. ID No. 5171	Seq. ID No. 5172
2474a	Seq. ID No. 5173	Seq. ID No. 5174
2475a	Seq. ID No. 5179	Seq. ID No. 5180

TABLE 19: GENEMARK™ ORFs

ORF Number	DNA SEQ ID Number	Protein SEQ ID Number
2477	Seq. ID No. 5185	Seq. ID No. 5186
2480	Seq. ID No. 5187	Seq. ID No. 5188
2482	Seq. ID No. 5193	Seq. ID No. 5194
2483	Seq. ID No. 5195	Seq. ID No. 5196
2485	Seq. ID No. 5201	Seq. ID No. 5202
2489	Seq. ID No. 5203	Seq. ID No. 5204
2490	Seq. ID No. 5205	Seq. ID No. 5206
2492b	Seq. ID No. 5209	Seq. ID No. 5210
2494	Seq. ID No. 5211	Seq. ID No. 5212
2495a	Seq. ID No. 5213	Seq. ID No. 5214
2497a	Seq. ID No. 5217	Seq. ID No. 5218
2500b	Seq. ID No. 5225	Seq. ID No. 5226
2501b	Seq. ID No. 5231	Seq. ID No. 5232
2504a	Seq. ID No. 5233	Seq. ID No. 5234
2505	Seq. ID No. 5237	Seq. ID No. 5238
2506	Seq. ID No. 5239	Seq. ID No. 5240
2510	Seq. ID No. 5245	Seq. ID No. 5246
2512c	Seq. ID No. 5247	Seq. ID No. 5248
2513a	Seq. ID No. 5249	Seq. ID No. 5250
2514	Seq. ID No. 5255	Seq. ID No. 5256
2515	Seq. ID No. 5257	Seq. ID No. 5258
2516a	Seq. ID No. 5259	Seq. ID No. 5260
2517a	Seq. ID No. 5263	Seq. ID No. 5264
2519a	Seq. ID No. 5269	Seq. ID No. 5270
2520a	Seq. ID No. 5273	Seq. ID No. 5274
2523	Seq. ID No. 5283	Seq. ID No. 5284
2527a	Seq. ID No. 5289	Seq. ID No. 5290
2528a	Seq. ID No. 5293	Seq. ID No. 5294

TABLE 19: GENEMARK™ ORFS

ORF Number	DNA SEQ ID Number	Protein SEQ ID Number
2535a	Seq. ID No. 5307	Seq. ID No. 5308
2538	Seq. ID No. 5311	Seq. ID No. 5312
2541	Seq. ID No. 5313	Seq. ID No. 5314
2542a	Seq. ID No. 5315	Seq. ID No. 5316
2544	Seq. ID No. 5323	Seq. ID No. 5324
2545	Seq. ID No. 5325	Seq. ID No. 5326
2548b	Seq. ID No. 5335	Seq. ID No. 5336
2549	Seq. ID No. 5337	Seq. ID No. 5338
2550b	Seq. ID No. 5339	Seq. ID No. 5340
2552	Seq. ID No. 5345	Seq. ID No. 5346
2553	Seq. ID No. 5347	Seq. ID No. 5348
2554a	Seq. ID No. 5349	Seq. ID No. 5350
2555a	Seq. ID No. 5353	Seq. ID No. 5354
2558a	Seq. ID No. 5361	Seq. ID No. 5362
2559	Seq. ID No. 5365	Seq. ID No. 5366
2561	Seq. ID No. 5367	Seq. ID No. 5368
2562a	Seq. ID No. 5369	Seq. ID No. 5370
2563	Seq. ID No. 5373	Seq. ID No. 5374
2564a	Seq. ID No. 5375	Seq. ID No. 5376
2567b	Seq. ID No. 5387	Seq. ID No. 5388
2568	Seq. ID No. 5389	Seq. ID No. 5390
2572	Seq. ID No. 5391	Seq. ID No. 5392
2573	Seq. ID No. 5393	Seq. ID No. 5394
2575	Seq. ID No. 5395	Seq. ID No. 5396
2576	Seq. ID No. 5397	Seq. ID No. 5398
2578	Seq. ID No. 5399	Seq. ID No. 5400
2579b	Seq. ID No. 5401	Seq. ID No. 5402
2581	Seq. ID No. 5403	Seq. ID No. 5404

TABLE 19: GENEMARK™ ORFS

ORF Number	DNA SEQ ID Number	Protein SEQ ID Number
2582a	Seq. ID No. 5405	Seq. ID No. 5406
2585	Seq. ID No. 5411	Seq. ID No. 5412
2587b	Seq. ID No. 5415	Seq. ID No. 5416
2588	Seq. ID No. 5417	Seq. ID No. 5418
2589	Seq. ID No. 5419	Seq. ID No. 5420
2591	Seq. ID No. 5421	Seq. ID No. 5422
2592	Seq. ID No. 5423	Seq. ID No. 5424
2594a	Seq. ID No. 5429	Seq. ID No. 5430
2596	Seq. ID No. 5433	Seq. ID No. 5434
2598	Seq. ID No. 5441	Seq. ID No. 5442
2602	Seq. ID No. 5443	Seq. ID No. 5444
2605a	Seq. ID No. 5445	Seq. ID No. 5446
2606	Seq. ID No. 5449	Seq. ID No. 5450
2608	Seq. ID No. 5451	Seq. ID No. 5452
2610	Seq. ID No. 5453	Seq. ID No. 5454
2611	Seq. ID No. 5455	Seq. ID No. 5456
2613	Seq. ID No. 5457	Seq. ID No. 5458
2616f	Seq. ID No. 5469	Seq. ID No. 5470
2617a	Seq. ID No. 5475	Seq. ID No. 5476
2619	Seq. ID No. 5483	Seq. ID No. 5484
2620	Seq. ID No. 5485	Seq. ID No. 5486
2623a	Seq. ID No. 5489	Seq. ID No. 5490
2624a	Seq. ID No. 5493	Seq. ID No. 5494
2625b	Seq. ID No. 5499	Seq. ID No. 5500
2626a	Seq. ID No. 5501	Seq. ID No. 5502
2627a	Seq. ID No. 5505	Seq. ID No. 5506
2628	Seq. ID No. 5509	Seq. ID No. 5510
2629a	Seq. ID No. 5511	Seq. ID No. 5512

TABLE 19: GENEMARK™ ORFS

ORF Number	DNA SEQ ID Number	Protein SEQ ID Number
2633c	Seq. ID No. 5523	Seq. ID No. 5524
2637a	Seq. ID No. 5529	Seq. ID No. 5530
2643a	Seq. ID No. 5535	Seq. ID No. 5536
2645	Seq. ID No. 5539	Seq. ID No. 5540
2647	Seq. ID No. 5541	Seq. ID No. 5542
2649	Seq. ID No. 5547	Seq. ID No. 5548
2652a	Seq. ID No. 5551	Seq. ID No. 5552
2655a	Seq. ID No. 5555	Seq. ID No. 5556
2656	Seq. ID No. 5559	Seq. ID No. 5560
2658a	Seq. ID No. 5561	Seq. ID No. 5562
2659a	Seq. ID No. 5565	Seq. ID No. 5566
2662	Seq. ID No. 5571	Seq. ID No. 5572
2664a	Seq. ID No. 5573	Seq. ID No. 5574
2666a	Seq. ID No. 5579	Seq. ID No. 5580
2667a	Seq. ID No. 5583	Seq. ID No. 5584
2669b	Seq. ID No. 5589	Seq. ID No. 5590
2674b	Seq. ID No. 5599	Seq. ID No. 5600
2676	Seq. ID No. 5601	Seq. ID No. 5602
2677a	Seq. ID No. 5603	Seq. ID No. 5604
2679c	Seq. ID No. 5613	Seq. ID No. 5614
2680c	Seq. ID No. 5621	Seq. ID No. 5622
2684a	Seq. ID No. 5627	Seq. ID No. 5628
2686	Seq. ID No. 5631	Seq. ID No. 5632
2688b	Seq. ID No. 5635	Seq. ID No. 5636
2690b	Seq. ID No. 5645	Seq. ID No. 5646
2693	Seq. ID No. 5651	Seq. ID No. 5652
2694a	Seq. ID No. 5653	Seq. ID No. 5654
2695	Seq. ID No. 5657	Seq. ID No. 5658

TABLE 19: GENEMARK™ ORFS

ORF Number	DNA SEQ ID Number	Protein SEQ ID Number
2696b	Seq. ID No. 5661	Seq. ID No. 5662
2705	Seq. ID No. 5663	Seq. ID No. 5664
2709	Seq. ID No. 5665	Seq. ID No. 5666
2712	Seq. ID No. 5669	Seq. ID No. 5670
2713	Seq. ID No. 5671	Seq. ID No. 5672
2714	Seq. ID No. 5673	Seq. ID No. 5674
2716a	Seq. ID No. 5675	Seq. ID No. 5676
2718a	Seq. ID No. 5681	Seq. ID No. 5682
2721b	Seq. ID No. 5693	Seq. ID No. 5694
2722a	Seq. ID No. 5695	Seq. ID No. 5696
2723	Seq. ID No. 5699	Seq. ID No. 5700
2724	Seq. ID No. 5701	Seq. ID No. 5702
2726	Seq. ID No. 5707	Seq. ID No. 5708
2731a	Seq. ID No. 5713	Seq. ID No. 5714
2732	Seq. ID No. 5717	Seq. ID No. 5718
2734c	Seq. ID No. 5723	Seq. ID No. 5724
2735a	Seq. ID No. 5725	Seq. ID No. 5726
2738b	Seq. ID No. 5731	Seq. ID No. 5732
2742a	Seq. ID No. 5737	Seq. ID No. 5738
2745a	Seq. ID No. 5747	Seq. ID No. 5748
2746	Seq. ID No. 5751	Seq. ID No. 5752
2747b	Seq. ID No. 5755	Seq. ID No. 5756
2748b	Seq. ID No. 5759	Seq. ID No. 5760
2749e	Seq. ID No. 5771	Seq. ID No. 5772
2750a	Seq. ID No. 5773	Seq. ID No. 5774
2752	Seq. ID No. 5777	Seq. ID No. 5778
2753	Seq. ID No. 5779	Seq. ID No. 5780
2757a	Seq. ID No. 5781	Seq. ID No. 5782

TABLE 19: GENEMARK™ ORFs

ORF Number	DNA SEQ ID Number	Protein SEQ ID Number
2758a	Seq. ID No. 5785	Seq. ID No. 5786
2759a	Seq. ID No. 5793	Seq. ID No. 5794
2760b	Seq. ID No. 5799	Seq. ID No. 5800
2763a	Seq. ID No. 5805	Seq. ID No. 5806
2764	Seq. ID No. 5811	Seq. ID No. 5812
2765c	Seq. ID No. 5815	Seq. ID No. 5816
2766a	Seq. ID No. 5817	Seq. ID No. 5818
2768b	Seq. ID No. 5823	Seq. ID No. 5824
2771a	Seq. ID No. 5831	Seq. ID No. 5832
2773	Seq. ID No. 5835	Seq. ID No. 5836
2774b	Seq. ID No. 5839	Seq. ID No. 5840
2776a	Seq. ID No. 5843	Seq. ID No. 5844
2777	Seq. ID No. 5847	Seq. ID No. 5848
2778	Seq. ID No. 5849	Seq. ID No. 5850
2779	Seq. ID No. 5851	Seq. ID No. 5852
2780	Seq. ID No. 5853	Seq. ID No. 5854
2784	Seq. ID No. 5855	Seq. ID No. 5856
2785a	Seq. ID No. 5857	Seq. ID No. 5858
2786a	Seq. ID No. 5861	Seq. ID No. 5862
2787a	Seq. ID No. 5867	Seq. ID No. 5868
2789	Seq. ID No. 5875	Seq. ID No. 5876
2790	Seq. ID No. 5877	Seq. ID No. 5878
2793	Seq. ID No. 5881	Seq. ID No. 5882
2799a	Seq. ID No. 5889	Seq. ID No. 5890
2801b	Seq. ID No. 5895	Seq. ID No. 5896
2804	Seq. ID No. 5897	Seq. ID No. 5898
2805b	Seq. ID No. 5901	Seq. ID No. 5902
2809	Seq. ID No. 5903	Seq. ID No. 5904

TABLE 19: GENEMARK™ ORFS

ORF Number	DNA SEQ ID Number	Protein SEQ ID Number
2810b	Seq. ID No. 5907	Seq. ID No. 5908
2812	Seq. ID No. 5913	Seq. ID No. 5914
2814	Seq. ID No. 5915	Seq. ID No. 5916
2815	Seq. ID No. 5917	Seq. ID No. 5918
2816	Seq. ID No. 5919	Seq. ID No. 5920
2818c	Seq. ID No. 5925	Seq. ID No. 5926
2819	Seq. ID No. 5931	Seq. ID No. 5932
2820	Seq. ID No. 5933	Seq. ID No. 5934
2821a	Seq. ID No. 5935	Seq. ID No. 5936
2822b	Seq. ID No. 5941	Seq. ID No. 5942
2823	Seq. ID No. 5943	Seq. ID No. 5944
2824a	Seq. ID No. 5945	Seq. ID No. 5946
2829a	Seq. ID No. 5949	Seq. ID No. 5950
2832	Seq. ID No. 5955	Seq. ID No. 5956
2833	Seq. ID No. 5957	Seq. ID No. 5958
2834a	Seq. ID No. 5959	Seq. ID No. 5960
2842a	Seq. ID No. 5967	Seq. ID No. 5968
2843a	Seq. ID No. 5971	Seq. ID No. 5972
2845	Seq. ID No. 5975	Seq. ID No. 5976
2846a	Seq. ID No. 5977	Seq. ID No. 5978
2848	Seq. ID No. 5981	Seq. ID No. 5982
2850	Seq. ID No. 5983	Seq. ID No. 5984
2851	Seq. ID No. 5985	Seq. ID No. 5986
2853	Seq. ID No. 5989	Seq. ID No. 5990
2854a	Seq. ID No. 5991	Seq. ID No. 5992
2855	Seq. ID No. 5995	Seq. ID No. 5996
2856a	Seq. ID No. 5997	Seq. ID No. 5998
2857	Seq. ID No. 6003	Seq. ID No. 6004

TABLE 19: GENEMARK™ ORFS

ORF Number	DNA SEQ ID Number	Protein SEQ ID Number
2859	Seq. ID No. 6005	Seq. ID No. 6006
2860a	Seq. ID No. 6007	Seq. ID No. 6008
2863	Seq. ID No. 6015	Seq. ID No. 6016
2864	Seq. ID No. 6017	Seq. ID No. 6018
2868a	Seq. ID No. 6019	Seq. ID No. 6020
2869a	Seq. ID No. 6023	Seq. ID No. 6024
2871	Seq. ID No. 6029	Seq. ID No. 6030
2875	Seq. ID No. 6033	Seq. ID No. 6034
2877	Seq. ID No. 6035	Seq. ID No. 6036
2879a	Seq. ID No. 6037	Seq. ID No. 6038
2881	Seq. ID No. 6043	Seq. ID No. 6044
2883b	Seq. ID No. 6049	Seq. ID No. 6050
2886a	Seq. ID No. 6055	Seq. ID No. 6056
2890	Seq. ID No. 6065	Seq. ID No. 6066
2891b	Seq. ID No. 6069	Seq. ID No. 6070
2894a	Seq. ID No. 6075	Seq. ID No. 6076
2895	Seq. ID No. 6081	Seq. ID No. 6082
2897a	Seq. ID No. 6083	Seq. ID No. 6084
2900a	Seq. ID No. 6087	Seq. ID No. 6088
2902	Seq. ID No. 6095	Seq. ID No. 6096
2904	Seq. ID No. 6097	Seq. ID No. 6098
2905a	Seq. ID No. 6099	Seq. ID No. 6100
2906	Seq. ID No. 6103	Seq. ID No. 6104
2909a	Seq. ID No. 6105	Seq. ID No. 6106
2912	Seq. ID No. 6113	Seq. ID No. 6114
2913a	Seq. ID No. 6115	Seq. ID No. 6116
2915a	Seq. ID No. 6119	Seq. ID No. 6120
2916	Seq. ID No. 6125	Seq. ID No. 6126

TABLE 19: GENEMARK™ ORFS

ORF Number	DNA SEQ ID Number	Protein SEQ ID Number
2917	Seq. ID No. 6127	Seq. ID No. 6128
2918	Seq. ID No. 6129	Seq. ID No. 6130
2920	Seq. ID No. 6131	Seq. ID No. 6132
2921	Seq. ID No. 6133	Seq. ID No. 6134
2923c	Seq. ID No. 6141	Seq. ID No. 6142
2925a	Seq. ID No. 6143	Seq. ID No. 6144
2926a	Seq. ID No. 6147	Seq. ID No. 6148
2928a	Seq. ID No. 6153	Seq. ID No. 6154
2931c	Seq. ID No. 6165	Seq. ID No. 6166
2933b	Seq. ID No. 6169	Seq. ID No. 6170
2934	Seq. ID No. 6171	Seq. ID No. 6172
2935a	Seq. ID No. 6173	Seq. ID No. 6174
2936	Seq. ID No. 6177	Seq. ID No. 6178
2939a	Seq. ID No. 6179	Seq. ID No. 6180
2941c	Seq. ID No. 6187	Seq. ID No. 6188
2943c	Seq. ID No. 6193	Seq. ID No. 6194
2947	Seq. ID No. 6201	Seq. ID No. 6202
2948c	Seq. ID No. 6207	Seq. ID No. 6208
2950a	Seq. ID No. 6211	Seq. ID No. 6212
2951	Seq. ID No. 6215	Seq. ID No. 6216
2954	Seq. ID No. 6219	Seq. ID No. 6220
2955f	Seq. ID No. 6231	Seq. ID No. 6232
2957	Seq. ID No. 6235	Seq. ID No. 6236
2959	Seq. ID No. 6243	Seq. ID No. 6244
2962a	Seq. ID No. 6247	Seq. ID No. 6248
2963	Seq. ID No. 6251	Seq. ID No. 6252
2965b	Seq. ID No. 6255	Seq. ID No. 6256
2967	Seq. ID No. 6261	Seq. ID No. 6262

TABLE 19: GENEMARK™ ORFS

ORF Number	DNA SEQ ID Number	Protein SEQ ID Number
2969	Seq. ID No. 6263	Seq. ID No. 6264
2971a	Seq. ID No. 6269	Seq. ID No. 6270
2974b	Seq. ID No. 6275	Seq. ID No. 6276
2975	Seq. ID No. 6277	Seq. ID No. 6278
2977a	Seq. ID No. 6279	Seq. ID No. 6280
2979	Seq. ID No. 6287	Seq. ID No. 6288
2980b	Seq. ID No. 6291	Seq. ID No. 6292
2984	Seq. ID No. 6299	Seq. ID No. 6300
2986c	Seq. ID No. 6305	Seq. ID No. 6306
2988a	Seq. ID No. 6307	Seq. ID No. 6308
2989	Seq. ID No. 6313	Seq. ID No. 6314
2990	Seq. ID No. 6315	Seq. ID No. 6316
2991c	Seq. ID No. 6321	Seq. ID No. 6322
2992	Seq. ID No. 6323	Seq. ID No. 6324
2993a	Seq. ID No. 6325	Seq. ID No. 6326
2995b	Seq. ID No. 6331	Seq. ID No. 6332
2998a	Seq. ID No. 6335	Seq. ID No. 6336
2999	Seq. ID No. 6339	Seq. ID No. 6340
3001	Seq. ID No. 6341	Seq. ID No. 6342
3003	Seq. ID No. 6343	Seq. ID No. 6344
3005	Seq. ID No. 6345	Seq. ID No. 6346
3008a	Seq. ID No. 6347	Seq. ID No. 6348
3010a	Seq. ID No. 6355	Seq. ID No. 6356
3012	Seq. ID No. 6359	Seq. ID No. 6360
3015	Seq. ID No. 6361	Seq. ID No. 6362
3016b	Seq. ID No. 6365	Seq. ID No. 6366
3017	Seq. ID No. 6369	Seq. ID No. 6370
3018a	Seq. ID No. 6371	Seq. ID No. 6372

TABLE 19: GENEMARK™ ORFS

ORF Number	DNA SEQ ID Number	Protein SEQ ID Number
3020	Seq. ID No. 6375	Seq. ID No. 6376
3021	Seq. ID No. 6377	Seq. ID No. 6378
3022	Seq. ID No. 6379	Seq. ID No. 6380
3026a	Seq. ID No. 6387	Seq. ID No. 6388
3028a	Seq. ID No. 6391	Seq. ID No. 6392
3029a	Seq. ID No. 6397	Seq. ID No. 6398
3031a	Seq. ID No. 6401	Seq. ID No. 6402
3032a	Seq. ID No. 6405	Seq. ID No. 6406
3033a	Seq. ID No. 6409	Seq. ID No. 6410
3035	Seq. ID No. 6413	Seq. ID No. 6414
3037b	Seq. ID No. 6417	Seq. ID No. 6418
3038	Seq. ID No. 6419	Seq. ID No. 6420
3040b	Seq. ID No. 6423	Seq. ID No. 6424
3043a	Seq. ID No. 6429	Seq. ID No. 6430
3044	Seq. ID No. 6433	Seq. ID No. 6434
3045a	Seq. ID No. 6435	Seq. ID No. 6436
3048a	Seq. ID No. 6439	Seq. ID No. 6440
3049c	Seq. ID No. 6445	Seq. ID No. 6446
3051a	Seq. ID No. 6447	Seq. ID No. 6448
3052	Seq. ID No. 6451	Seq. ID No. 6452
3055a	Seq. ID No. 6455	Seq. ID No. 6456
3057	Seq. ID No. 6459	Seq. ID No. 6460
3059	Seq. ID No. 6461	Seq. ID No. 6462
3060	Seq. ID No. 6463	Seq. ID No. 6464
3065a	Seq. ID No. 6475	Seq. ID No. 6476
3067	Seq. ID No. 6481	Seq. ID No. 6482
3068	Seq. ID No. 6483	Seq. ID No. 6484
3069	Seq. ID No. 6485	Seq. ID No. 6486

TABLE 19: GENEMARK™ ORFs

ORF Number	DNA SEQ ID Number	Protein SEQ ID Number
3071	Seq. ID No. 6487	Seq. ID No. 6488
3072a	Seq. ID No. 6489	Seq. ID No. 6490
3073	Seq. ID No. 6491	Seq. ID No. 6492
3074	Seq. ID No. 6493	Seq. ID No. 6494
3075	Seq. ID No. 6495	Seq. ID No. 6496
3077a	Seq. ID No. 6499	Seq. ID No. 6500
3078	Seq. ID No. 6505	Seq. ID No. 6506
3081a	Seq. ID No. 6509	Seq. ID No. 6510
3083c	Seq. ID No. 6513	Seq. ID No. 6514
3086	Seq. ID No. 6519	Seq. ID No. 6520
3087a	Seq. ID No. 6521	Seq. ID No. 6522
3088	Seq. ID No. 6525	Seq. ID No. 6526
3089a	Seq. ID No. 6527	Seq. ID No. 6528
3090	Seq. ID No. 6531	Seq. ID No. 6532
3091	Seq. ID No. 6533	Seq. ID No. 6534
3092a	Seq. ID No. 6535	Seq. ID No. 6536
3097	Seq. ID No. 6545	Seq. ID No. 6546
3098c	Seq. ID No. 6551	Seq. ID No. 6552
3099	Seq. ID No. 6553	Seq. ID No. 6554
3101	Seq. ID No. 6559	Seq. ID No. 6560
3102	Seq. ID No. 6561	Seq. ID No. 6562
3103b	Seq. ID No. 6563	Seq. ID No. 6564
3104	Seq. ID No. 6565	Seq. ID No. 6566
3105	Seq. ID No. 6567	Seq. ID No. 6568
3106	Seq. ID No. 6569	Seq. ID No. 6570
3108a	Seq. ID No. 6575	Seq. ID No. 6576
3109	Seq. ID No. 6579	Seq. ID No. 6580
3110b	Seq. ID No. 6583	Seq. ID No. 6584

TABLE 19: GENEMARK™ ORFS

ORF Number	DNA SEQ ID Number	Protein SEQ ID Number
3113	Seq. ID No. 6585	Seq. ID No. 6586
3118b	Seq. ID No. 6591	Seq. ID No. 6592
3119b	Seq. ID No. 6595	Seq. ID No. 6596
3121	Seq. ID No. 6605	Seq. ID No. 6606
3122a	Seq. ID No. 6607	Seq. ID No. 6608
3123a	Seq. ID No. 6611	Seq. ID No. 6612
3124	Seq. ID No. 6615	Seq. ID No. 6616
3126	Seq. ID No. 6617	Seq. ID No. 6618
3129a	Seq. ID No. 6619	Seq. ID No. 6620
3131	Seq. ID No. 6623	Seq. ID No. 6624
3134a	Seq. ID No. 6625	Seq. ID No. 6626
3138	Seq. ID No. 6629	Seq. ID No. 6630
3141	Seq. ID No. 6633	Seq. ID No. 6634
3145a	Seq. ID No. 6635	Seq. ID No. 6636
3147a	Seq. ID No. 6641	Seq. ID No. 6642
3149a	Seq. ID No. 6647	Seq. ID No. 6648

Listed in Table 20 are 2343 ORFs detected by the ORF finder program of Applicant's assignee that searches for one of the three potential Start codons between a Stop-Stop region. It first looks for a 'ATG' Start codon but will accept either a 'GTG' or 'TTG' Start codon if found first.

TABLE 20: WYETH ORFS

ORF Number	DNA SEQ ID Number	Protein SEQ ID Number
1	Seq. ID No. 1	Seq. ID No. 2
2b	Seq. ID No. 5	Seq. ID No. 6
4c	Seq. ID No. 11	Seq. ID No. 12
5	Seq. ID No. 13	Seq. ID No. 14

TABLE 20: WYETH ORFS

ORF Number	DNA SEQ ID Number	Protein SEQ ID Number
7	Seq. ID No. 15	Seq. ID No. 16
10	Seq. ID No. 17	Seq. ID No. 18
11	Seq. ID No. 19	Seq. ID No. 20
13a	Seq. ID No. 21	Seq. ID No. 22
16	Seq. ID No. 23	Seq. ID No. 24
18	Seq. ID No. 27	Seq. ID No. 28
20	Seq. ID No. 29	Seq. ID No. 30
21b	Seq. ID No. 31	Seq. ID No. 32
23b	Seq. ID No. 35	Seq. ID No. 36
24	Seq. ID No. 37	Seq. ID No. 38
36	Seq. ID No. 41	Seq. ID No. 42
37	Seq. ID No. 43	Seq. ID No. 44
38a	Seq. ID No. 45	Seq. ID No. 46
38b	Seq. ID No. 47	Seq. ID No. 48
39a	Seq. ID No. 49	Seq. ID No. 50
39b	Seq. ID No. 51	Seq. ID No. 52
40	Seq. ID No. 53	Seq. ID No. 54
41a	Seq. ID No. 55	Seq. ID No. 56
41b	Seq. ID No. 57	Seq. ID No. 58
41c	Seq. ID No. 59	Seq. ID No. 60
44a	Seq. ID No. 65	Seq. ID No. 66
44b	Seq. ID No. 67	Seq. ID No. 68
47	Seq. ID No. 75	Seq. ID No. 76
48a	Seq. ID No. 77	Seq. ID No. 78
48b	Seq. ID No. 79	Seq. ID No. 80
48c	Seq. ID No. 81	Seq. ID No. 82
50	Seq. ID No. 83	Seq. ID No. 84
51c	Seq. ID No. 89	Seq. ID No. 90
55	Seq. ID No. 91	Seq. ID No. 92

TABLE 20: WYETH ORFs

ORF Number	DNA SEQ ID Number	Protein SEQ ID Number
56b	Seq. ID No. 93	Seq. ID No. 94
57b	Seq. ID No. 97	Seq. ID No. 98
58	Seq. ID No. 99	Seq. ID No. 100
60b	Seq. ID No. 103	Seq. ID No. 104
61	Seq. ID No. 105	Seq. ID No. 106
62a	Seq. ID No. 107	Seq. ID No. 108
62b	Seq. ID No. 109	Seq. ID No. 110
62c	Seq. ID No. 111	Seq. ID No. 112
63a	Seq. ID No. 113	Seq. ID No. 114
63b	Seq. ID No. 115	Seq. ID No. 116
65a	Seq. ID No. 117	Seq. ID No. 118
65b	Seq. ID No. 119	Seq. ID No. 120
65c	Seq. ID No. 121	Seq. ID No. 122
69	Seq. ID No. 127	Seq. ID No. 128
71	Seq. ID No. 129	Seq. ID No. 130
73a	Seq. ID No. 131	Seq. ID No. 132
73b	Seq. ID No. 133	Seq. ID No. 134
74	Seq. ID No. 135	Seq. ID No. 136
77	Seq. ID No. 137	Seq. ID No. 138
79	Seq. ID No. 139	Seq. ID No. 140
80b	Seq. ID No. 143	Seq. ID No. 144
80c	Seq. ID No. 145	Seq. ID No. 146
81a	Seq. ID No. 147	Seq. ID No. 148
81b	Seq. ID No. 149	Seq. ID No. 150
85a	Seq. ID No. 153	Seq. ID No. 154
85b	Seq. ID No. 155	Seq. ID No. 156
85c	Seq. ID No. 157	Seq. ID No. 158
86	Seq. ID No. 159	Seq. ID No. 160
87a	Seq. ID No. 161	Seq. ID No. 162

TABLE 20: WYETH ORFs

ORF Number	DNA SEQ ID Number	Protein SEQ ID Number
87b	Seq. ID No. 163	Seq. ID No. 164
87c	Seq. ID No. 165	Seq. ID No. 166
88	Seq. ID No. 167	Seq. ID No. 168
89	Seq. ID No. 169	Seq. ID No. 170
91a	Seq. ID No. 171	Seq. ID No. 172
91c	Seq. ID No. 175	Seq. ID No. 176
91d	Seq. ID No. 177	Seq. ID No. 178
93a	Seq. ID No. 179	Seq. ID No. 180
93b	Seq. ID No. 181	Seq. ID No. 182
93c	Seq. ID No. 183	Seq. ID No. 184
95b	Seq. ID No. 187	Seq. ID No. 188
99	Seq. ID No. 191	Seq. ID No. 192
101	Seq. ID No. 193	Seq. ID No. 194
102	Seq. ID No. 195	Seq. ID No. 196
104c	Seq. ID No. 201	Seq. ID No. 202
105b	Seq. ID No. 205	Seq. ID No. 206
106	Seq. ID No. 207	Seq. ID No. 208
109d	Seq. ID No. 215	Seq. ID No. 216
111b	Seq. ID No. 219	Seq. ID No. 220
112a	Seq. ID No. 221	Seq. ID No. 222
112b	Seq. ID No. 223	Seq. ID No. 224
114	Seq. ID No. 225	Seq. ID No. 226
115	Seq. ID No. 227	Seq. ID No. 228
119b	Seq. ID No. 231	Seq. ID No. 232
121	Seq. ID No. 233	Seq. ID No. 234
124c	Seq. ID No. 239	Seq. ID No. 240
127a	Seq. ID No. 243	Seq. ID No. 244
127b	Seq. ID No. 245	Seq. ID No. 246
127c	Seq. ID No. 247	Seq. ID No. 248

TABLE 20: WYETH ORFs

ORF Number	DNA SEQ ID Number	Protein SEQ ID Number
129c	Seq. ID No. 253	Seq. ID No. 254
132b	Seq. ID No. 257	Seq. ID No. 258
132c	Seq. ID No. 259	Seq. ID No. 260
134	Seq. ID No. 261	Seq. ID No. 262
135a	Seq. ID No. 263	Seq. ID No. 264
135b	Seq. ID No. 265	Seq. ID No. 266
137a	Seq. ID No. 267	Seq. ID No. 268
137b	Seq. ID No. 269	Seq. ID No. 270
138b	Seq. ID No. 273	Seq. ID No. 274
143	Seq. ID No. 277	Seq. ID No. 278
144a	Seq. ID No. 279	Seq. ID No. 280
144b	Seq. ID No. 281	Seq. ID No. 282
144c	Seq. ID No. 283	Seq. ID No. 284
145d	Seq. ID No. 291	Seq. ID No. 292
147	Seq. ID No. 293	Seq. ID No. 294
151b	Seq. ID No. 297	Seq. ID No. 298
152b	Seq. ID No. 301	Seq. ID No. 302
153b	Seq. ID No. 305	Seq. ID No. 306
153c	Seq. ID No. 307	Seq. ID No. 308
154	Seq. ID No. 309	Seq. ID No. 310
155b	Seq. ID No. 313	Seq. ID No. 314
157b	Seq. ID No. 317	Seq. ID No. 318
158b	Seq. ID No. 321	Seq. ID No. 322
160a	Seq. ID No. 323	Seq. ID No. 324
160b	Seq. ID No. 325	Seq. ID No. 326
162c	Seq. ID No. 331	Seq. ID No. 332
162d	Seq. ID No. 333	Seq. ID No. 334
162e	Seq. ID No. 335	Seq. ID No. 336
163	Seq. ID No. 337	Seq. ID No. 338

TABLE 20: WYETH ORFS

ORF Number	DNA SEQ ID Number	Protein SEQ ID Number
164	Seq. ID No. 339	Seq. ID No. 340
165b	Seq. ID No. 343	Seq. ID No. 344
167	Seq. ID No. 345	Seq. ID No. 346
169	Seq. ID No. 347	Seq. ID No. 348
170	Seq. ID No. 349	Seq. ID No. 350
171b	Seq. ID No. 353	Seq. ID No. 354
172	Seq. ID No. 355	Seq. ID No. 356
173	Seq. ID No. 357	Seq. ID No. 358
174	Seq. ID No. 359	Seq. ID No. 360
175	Seq. ID No. 361	Seq. ID No. 362
176	Seq. ID No. 363	Seq. ID No. 364
177a	Seq. ID No. 365	Seq. ID No. 366
177b	Seq. ID No. 367	Seq. ID No. 368
179a	Seq. ID No. 369	Seq. ID No. 370
179b	Seq. ID No. 371	Seq. ID No. 372
180b	Seq. ID No. 375	Seq. ID No. 376
183a	Seq. ID No. 377	Seq. ID No. 378
184	Seq. ID No. 379	Seq. ID No. 380
186	Seq. ID No. 383	Seq. ID No. 384
187a	Seq. ID No. 385	Seq. ID No. 386
187b	Seq. ID No. 387	Seq. ID No. 388
188	Seq. ID No. 389	Seq. ID No. 390
189b	Seq. ID No. 391	Seq. ID No. 392
191b	Seq. ID No. 393	Seq. ID No. 394
192b	Seq. ID No. 397	Seq. ID No. 398
194a	Seq. ID No. 401	Seq. ID No. 402
194b	Seq. ID No. 403	Seq. ID No. 404
195	Seq. ID No. 405	Seq. ID No. 406
196	Seq. ID No. 407	Seq. ID No. 408

TABLE 20: WYETH ORFs

ORF Number	DNA SEQ ID Number	Protein SEQ ID Number
197a	Seq. ID No. 409	Seq. ID No. 410
198b	Seq. ID No. 415	Seq. ID No. 416
203	Seq. ID No. 423	Seq. ID No. 424
204	Seq. ID No. 425	Seq. ID No. 426
205	Seq. ID No. 427	Seq. ID No. 428
206	Seq. ID No. 429	Seq. ID No. 430
207	Seq. ID No. 431	Seq. ID No. 432
208a	Seq. ID No. 433	Seq. ID No. 434
208b	Seq. ID No. 435	Seq. ID No. 436
210	Seq. ID No. 437	Seq. ID No. 438
211	Seq. ID No. 439	Seq. ID No. 440
213	Seq. ID No. 441	Seq. ID No. 442
215a	Seq. ID No. 443	Seq. ID No. 444
218	Seq. ID No. 445	Seq. ID No. 446
219	Seq. ID No. 447	Seq. ID No. 448
220b	Seq. ID No. 451	Seq. ID No. 452
220c	Seq. ID No. 453	Seq. ID No. 454
223a	Seq. ID No. 455	Seq. ID No. 456
223b	Seq. ID No. 457	Seq. ID No. 458
226b	Seq. ID No. 461	Seq. ID No. 462
227	Seq. ID No. 463	Seq. ID No. 464
228b	Seq. ID No. 467	Seq. ID No. 468
228c	Seq. ID No. 469	Seq. ID No. 470
228d	Seq. ID No. 471	Seq. ID No. 472
232a	Seq. ID No. 473	Seq. ID No. 474
232b	Seq. ID No. 475	Seq. ID No. 476
235a	Seq. ID No. 477	Seq. ID No. 478
235b	Seq. ID No. 479	Seq. ID No. 480
236a	Seq. ID No. 481	Seq. ID No. 482

TABLE 20: WYETH ORFs

ORF Number	DNA SEQ ID Number	Protein SEQ ID Number
236b	Seq. ID No. 483	Seq. ID No. 484
236c	Seq. ID No. 485	Seq. ID No. 486
239b	Seq. ID No. 489	Seq. ID No. 490
239c	Seq. ID No. 491	Seq. ID No. 492
240	Seq. ID No. 493	Seq. ID No. 494
241	Seq. ID No. 495	Seq. ID No. 496
245c	Seq. ID No. 501	Seq. ID No. 502
246b	Seq. ID No. 505	Seq. ID No. 506
247	Seq. ID No. 507	Seq. ID No. 508
248b	Seq. ID No. 511	Seq. ID No. 512
249b	Seq. ID No. 515	Seq. ID No. 516
251	Seq. ID No. 517	Seq. ID No. 518
254	Seq. ID No. 523	Seq. ID No. 524
255c	Seq. ID No. 529	Seq. ID No. 530
255d	Seq. ID No. 531	Seq. ID No. 532
258	Seq. ID No. 533	Seq. ID No. 534
259b	Seq. ID No. 537	Seq. ID No. 538
259c	Seq. ID No. 539	Seq. ID No. 540
262	Seq. ID No. 543	Seq. ID No. 544
263b	Seq. ID No. 547	Seq. ID No. 548
264b	Seq. ID No. 549	Seq. ID No. 550
265	Seq. ID No. 551	Seq. ID No. 552
267b	Seq. ID No. 553	Seq. ID No. 554
267c	Seq. ID No. 555	Seq. ID No. 556
268	Seq. ID No. 557	Seq. ID No. 558
269a	Seq. ID No. 559	Seq. ID No. 560
269b	Seq. ID No. 561	Seq. ID No. 562
271b	Seq. ID No. 565	Seq. ID No. 566
273b	Seq. ID No. 569	Seq. ID No. 570

TABLE 20: WYETH ORFS

ORF Number	DNA SEQ ID Number	Protein SEQ ID Number
277a	Seq. ID No. 571	Seq. ID No. 572
277b	Seq. ID No. 573	Seq. ID No. 574
277c	Seq. ID No. 575	Seq. ID No. 576
279b	Seq. ID No. 579	Seq. ID No. 580
280a	Seq. ID No. 581	Seq. ID No. 582
280c	Seq. ID No. 585	Seq. ID No. 586
280d	Seq. ID No. 587	Seq. ID No. 588
282	Seq. ID No. 589	Seq. ID No. 590
283a	Seq. ID No. 591	Seq. ID No. 592
283b	Seq. ID No. 593	Seq. ID No. 594
284a	Seq. ID No. 595	Seq. ID No. 596
284b	Seq. ID No. 597	Seq. ID No. 598
285b	Seq. ID No. 599	Seq. ID No. 600
286a	Seq. ID No. 601	Seq. ID No. 602
286b	Seq. ID No. 603	Seq. ID No. 604
287	Seq. ID No. 605	Seq. ID No. 606
290b	Seq. ID No. 609	Seq. ID No. 610
294	Seq. ID No. 613	Seq. ID No. 614
296	Seq. ID No. 615	Seq. ID No. 616
297	Seq. ID No. 617	Seq. ID No. 618
300b	Seq. ID No. 619	Seq. ID No. 620
301a	Seq. ID No. 621	Seq. ID No. 622
301b	Seq. ID No. 623	Seq. ID No. 624
304a	Seq. ID No. 625	Seq. ID No. 626
304b	Seq. ID No. 627	Seq. ID No. 628
310	Seq. ID No. 635	Seq. ID No. 636
311	Seq. ID No. 637	Seq. ID No. 638
313c	Seq. ID No. 643	Seq. ID No. 644
313d	Seq. ID No. 645	Seq. ID No. 646

TABLE 20: WYETH ORFs

ORF Number	DNA SEQ ID Number	Protein SEQ ID Number
313e	Seq. ID No. 647	Seq. ID No. 648
315	Seq. ID No. 649	Seq. ID No. 650
317b	Seq. ID No. 655	Seq. ID No. 656
318d	Seq. ID No. 663	Seq. ID No. 664
318e	Seq. ID No. 665	Seq. ID No. 666
320	Seq. ID No. 667	Seq. ID No. 668
321	Seq. ID No. 669	Seq. ID No. 670
324	Seq. ID No. 675	Seq. ID No. 676
327c	Seq. ID No. 681	Seq. ID No. 682
329	Seq. ID No. 683	Seq. ID No. 684
330b	Seq. ID No. 687	Seq. ID No. 688
330c	Seq. ID No. 689	Seq. ID No. 690
331	Seq. ID No. 691	Seq. ID No. 692
333	Seq. ID No. 695	Seq. ID No. 696
334	Seq. ID No. 697	Seq. ID No. 698
335a	Seq. ID No. 699	Seq. ID No. 700
335b	Seq. ID No. 701	Seq. ID No. 702
337	Seq. ID No. 703	Seq. ID No. 704
338a	Seq. ID No. 705	Seq. ID No. 706
338b	Seq. ID No. 707	Seq. ID No. 708
338c	Seq. ID No. 709	Seq. ID No. 710
341b	Seq. ID No. 713	Seq. ID No. 714
342f	Seq. ID No. 725	Seq. ID No. 726
342g	Seq. ID No. 727	Seq. ID No. 728
342h	Seq. ID No. 729	Seq. ID No. 730
344a	Seq. ID No. 731	Seq. ID No. 732
344b	Seq. ID No. 733	Seq. ID No. 734
345	Seq. ID No. 735	Seq. ID No. 736
346b	Seq. ID No. 739	Seq. ID No. 740

TABLE 20: WYETH ORFS

ORF Number	DNA SEQ ID Number	Protein SEQ ID Number
347	Seq. ID No. 741	Seq. ID No. 742
349b	Seq. ID No. 745	Seq. ID No. 746
349c	Seq. ID No. 747	Seq. ID No. 748
350a	Seq. ID No. 749	Seq. ID No. 750
350b	Seq. ID No. 751	Seq. ID No. 752
351	Seq. ID No. 753	Seq. ID No. 754
352c	Seq. ID No. 759	Seq. ID No. 760
354b	Seq. ID No. 763	Seq. ID No. 764
354c	Seq. ID No. 765	Seq. ID No. 766
356c	Seq. ID No. 773	Seq. ID No. 774
356d	Seq. ID No. 775	Seq. ID No. 776
358c	Seq. ID No. 781	Seq. ID No. 782
362	Seq. ID No. 783	Seq. ID No. 784
365b	Seq. ID No. 787	Seq. ID No. 788
367a	Seq. ID No. 793	Seq. ID No. 794
367b	Seq. ID No. 795	Seq. ID No. 796
371b	Seq. ID No. 799	Seq. ID No. 800
372a	Seq. ID No. 801	Seq. ID No. 802
372c	Seq. ID No. 805	Seq. ID No. 806
372d	Seq. ID No. 807	Seq. ID No. 808
374	Seq. ID No. 809	Seq. ID No. 810
377a	Seq. ID No. 811	Seq. ID No. 812
377b	Seq. ID No. 813	Seq. ID No. 814
378a	Seq. ID No. 815	Seq. ID No. 816
378b	Seq. ID No. 817	Seq. ID No. 818
382b	Seq. ID No. 819	Seq. ID No. 820
383a	Seq. ID No. 821	Seq. ID No. 822
383b	Seq. ID No. 823	Seq. ID No. 824
384b	Seq. ID No. 827	Seq. ID No. 828

TABLE 20: WYETH ORFS

ORF Number	DNA SEQ ID Number	Protein SEQ ID Number
385a	Seq. ID No. 829	Seq. ID No. 830
385b	Seq. ID No. 831	Seq. ID No. 832
387	Seq. ID No. 835	Seq. ID No. 836
390	Seq. ID No. 837	Seq. ID No. 838
391	Seq. ID No. 839	Seq. ID No. 840
395a	Seq. ID No. 843	Seq. ID No. 844
395b	Seq. ID No. 845	Seq. ID No. 846
395c	Seq. ID No. 847	Seq. ID No. 848
400b	Seq. ID No. 855	Seq. ID No. 856
401b	Seq. ID No. 859	Seq. ID No. 860
403a	Seq. ID No. 861	Seq. ID No. 862
403c	Seq. ID No. 865	Seq. ID No. 866
403d	Seq. ID No. 867	Seq. ID No. 868
406b	Seq. ID No. 871	Seq. ID No. 872
409a	Seq. ID No. 873	Seq. ID No. 874
409b	Seq. ID No. 875	Seq. ID No. 876
410a	Seq. ID No. 877	Seq. ID No. 878
410b	Seq. ID No. 879	Seq. ID No. 880
410c	Seq. ID No. 881	Seq. ID No. 882
413b	Seq. ID No. 885	Seq. ID No. 886
418b	Seq. ID No. 895	Seq. ID No. 896
419a	Seq. ID No. 897	Seq. ID No. 898
419b	Seq. ID No. 899	Seq. ID No. 900
419c	Seq. ID No. 901	Seq. ID No. 902
420a	Seq. ID No. 903	Seq. ID No. 904
420b	Seq. ID No. 905	Seq. ID No. 906
421	Seq. ID No. 907	Seq. ID No. 908
422	Seq. ID No. 909	Seq. ID No. 910
424b	Seq. ID No. 913	Seq. ID No. 914

TABLE 20: WYETH ORFs

ORF Number	DNA SEQ ID Number	Protein SEQ ID Number
424c	Seq. ID No. 915	Seq. ID No. 916
427a	Seq. ID No. 921	Seq. ID No. 922
427b	Seq. ID No. 923	Seq. ID No. 924
427c	Seq. ID No. 925	Seq. ID No. 926
429c	Seq. ID No. 931	Seq. ID No. 932
429d	Seq. ID No. 933	Seq. ID No. 934
431	Seq. ID No. 935	Seq. ID No. 936
434	Seq. ID No. 937	Seq. ID No. 938
435	Seq. ID No. 939	Seq. ID No. 940
437b	Seq. ID No. 941	Seq. ID No. 942
437c	Seq. ID No. 943	Seq. ID No. 944
438b	Seq. ID No. 947	Seq. ID No. 948
438c	Seq. ID No. 949	Seq. ID No. 950
440	Seq. ID No. 951	Seq. ID No. 952
441a	Seq. ID No. 953	Seq. ID No. 954
441b	Seq. ID No. 955	Seq. ID No. 956
443b	Seq. ID No. 957	Seq. ID No. 958
444b	Seq. ID No. 961	Seq. ID No. 962
445a	Seq. ID No. 963	Seq. ID No. 964
445b	Seq. ID No. 965	Seq. ID No. 966
448	Seq. ID No. 967	Seq. ID No. 968
450a	Seq. ID No. 969	Seq. ID No. 970
450b	Seq. ID No. 971	Seq. ID No. 972
451a	Seq. ID No. 973	Seq. ID No. 974
451b	Seq. ID No. 975	Seq. ID No. 976
452c	Seq. ID No. 981	Seq. ID No. 982
452d	Seq. ID No. 983	Seq. ID No. 984
452e	Seq. ID No. 985	Seq. ID No. 986
454b	Seq. ID No. 987	Seq. ID No. 988

TABLE 20: WYETH ORFs

ORF Number	DNA SEQ ID Number	Protein SEQ ID Number
455a	Seq. ID No. 989	Seq. ID No. 990
455b	Seq. ID No. 991	Seq. ID No. 992
455c	Seq. ID No. 993	Seq. ID No. 994
458a	Seq. ID No. 995	Seq. ID No. 996
458b	Seq. ID No. 997	Seq. ID No. 998
460b	Seq. ID No. 1001	Seq. ID No. 1002
460c	Seq. ID No. 1003	Seq. ID No. 1004
462	Seq. ID No. 1005	Seq. ID No. 1006
463a	Seq. ID No. 1007	Seq. ID No. 1008
463b	Seq. ID No. 1009	Seq. ID No. 1010
464d	Seq. ID No. 1017	Seq. ID No. 1018
465b	Seq. ID No. 1019	Seq. ID No. 1020
467b	Seq. ID No. 1023	Seq. ID No. 1024
471a	Seq. ID No. 1025	Seq. ID No. 1026
471b	Seq. ID No. 1027	Seq. ID No. 1028
472f	Seq. ID No. 1039	Seq. ID No. 1040
473	Seq. ID No. 1041	Seq. ID No. 1042
474	Seq. ID No. 1043	Seq. ID No. 1044
476	Seq. ID No. 1045	Seq. ID No. 1046
477b	Seq. ID No. 1047	Seq. ID No. 1048
478a	Seq. ID No. 1049	Seq. ID No. 1050
478b	Seq. ID No. 1051	Seq. ID No. 1052
480b	Seq. ID No. 1057	Seq. ID No. 1058
481a	Seq. ID No. 1059	Seq. ID No. 1060
481b	Seq. ID No. 1061	Seq. ID No. 1062
482b	Seq. ID No. 1065	Seq. ID No. 1066
490	Seq. ID No. 1069	Seq. ID No. 1070
492	Seq. ID No. 1075	Seq. ID No. 1076
494a	Seq. ID No. 1077	Seq. ID No. 1078

TABLE 20: WYETH ORFS

ORF Number	DNA SEQ ID Number	Protein SEQ ID Number
495a	Seq. ID No. 1079	Seq. ID No. 1080
495b	Seq. ID No. 1081	Seq. ID No. 1082
495c	Seq. ID No. 1083	Seq. ID No. 1084
498a	Seq. ID No. 1085	Seq. ID No. 1086
498b	Seq. ID No. 1087	Seq. ID No. 1088
499b	Seq. ID No. 1091	Seq. ID No. 1092
500	Seq. ID No. 1093	Seq. ID No. 1094
502b	Seq. ID No. 1095	Seq. ID No. 1096
502c	Seq. ID No. 1097	Seq. ID No. 1098
504	Seq. ID No. 1099	Seq. ID No. 1100
505a	Seq. ID No. 1101	Seq. ID No. 1102
505b	Seq. ID No. 1103	Seq. ID No. 1104
507b	Seq. ID No. 1107	Seq. ID No. 1108
509	Seq. ID No. 1109	Seq. ID No. 1110
510	Seq. ID No. 1111	Seq. ID No. 1112
512a	Seq. ID No. 1113	Seq. ID No. 1114
512b	Seq. ID No. 1115	Seq. ID No. 1116
515a	Seq. ID No. 1119	Seq. ID No. 1120
515b	Seq. ID No. 1121	Seq. ID No. 1122
515c	Seq. ID No. 1123	Seq. ID No. 1124
518a	Seq. ID No. 1125	Seq. ID No. 1126
518b	Seq. ID No. 1127	Seq. ID No. 1128
518c	Seq. ID No. 1129	Seq. ID No. 1130
521b	Seq. ID No. 1131	Seq. ID No. 1132
524b	Seq. ID No. 1137	Seq. ID No. 1138
525	Seq. ID No. 1139	Seq. ID No. 1140
527a	Seq. ID No. 1141	Seq. ID No. 1142
527b	Seq. ID No. 1143	Seq. ID No. 1144
528a	Seq. ID No. 1145	Seq. ID No. 1146

TABLE 20: WYETH ORFS

ORF Number	DNA SEQ ID Number	Protein SEQ ID Number
528b	Seq. ID No. 1147	Seq. ID No. 1148
529	Seq. ID No. 1149	Seq. ID No. 1150
530a	Seq. ID No. 1151	Seq. ID No. 1152
530b	Seq. ID No. 1153	Seq. ID No. 1154
533	Seq. ID No. 1155	Seq. ID No. 1156
535	Seq. ID No. 1157	Seq. ID No. 1158
536	Seq. ID No. 1159	Seq. ID No. 1160
539b	Seq. ID No. 1161	Seq. ID No. 1162
539c	Seq. ID No. 1163	Seq. ID No. 1164
541d	Seq. ID No. 1171	Seq. ID No. 1172
543a	Seq. ID No. 1175	Seq. ID No. 1176
543b	Seq. ID No. 1177	Seq. ID No. 1178
543c	Seq. ID No. 1179	Seq. ID No. 1180
544	Seq. ID No. 1181	Seq. ID No. 1182
545c	Seq. ID No. 1187	Seq. ID No. 1188
546b	Seq. ID No. 1191	Seq. ID No. 1192
546c	Seq. ID No. 1193	Seq. ID No. 1194
547a	Seq. ID No. 1195	Seq. ID No. 1196
547b	Seq. ID No. 1197	Seq. ID No. 1198
549b	Seq. ID No. 1201	Seq. ID No. 1202
550a	Seq. ID No. 1203	Seq. ID No. 1204
551	Seq. ID No. 1205	Seq. ID No. 1206
553c	Seq. ID No. 1207	Seq. ID No. 1208
554b	Seq. ID No. 1211	Seq. ID No. 1212
556	Seq. ID No. 1213	Seq. ID No. 1214
557a	Seq. ID No. 1215	Seq. ID No. 1216
557b	Seq. ID No. 1217	Seq. ID No. 1218
560b	Seq. ID No. 1221	Seq. ID No. 1222
561	Seq. ID No. 1223	Seq. ID No. 1224

TABLE 20: WYETH ORFs

ORF Number	DNA SEQ ID Number	Protein SEQ ID Number
563	Seq. ID No. 1225	Seq. ID No. 1226
564c	Seq. ID No. 1231	Seq. ID No. 1232
569	Seq. ID No. 1233	Seq. ID No. 1234
570b	Seq. ID No. 1237	Seq. ID No. 1238
571	Seq. ID No. 1239	Seq. ID No. 1240
573	Seq. ID No. 1241	Seq. ID No. 1242
576b	Seq. ID No. 1245	Seq. ID No. 1246
578a	Seq. ID No. 1247	Seq. ID No. 1248
578b	Seq. ID No. 1249	Seq. ID No. 1250
580a	Seq. ID No. 1251	Seq. ID No. 1252
580b	Seq. ID No. 1253	Seq. ID No. 1254
583a	Seq. ID No. 1255	Seq. ID No. 1256
583b	Seq. ID No. 1257	Seq. ID No. 1258
585b	Seq. ID No. 1259	Seq. ID No. 1260
586a	Seq. ID No. 1261	Seq. ID No. 1262
586b	Seq. ID No. 1263	Seq. ID No. 1264
587d	Seq. ID No. 1271	Seq. ID No. 1272
588a	Seq. ID No. 1273	Seq. ID No. 1274
588b	Seq. ID No. 1275	Seq. ID No. 1276
589a	Seq. ID No. 1277	Seq. ID No. 1278
589b	Seq. ID No. 1279	Seq. ID No. 1280
595b	Seq. ID No. 1285	Seq. ID No. 1286
596b	Seq. ID No. 1289	Seq. ID No. 1290
596c	Seq. ID No. 1291	Seq. ID No. 1292
597	Seq. ID No. 1293	Seq. ID No. 1294
598a	Seq. ID No. 1295	Seq. ID No. 1296
598b	Seq. ID No. 1297	Seq. ID No. 1298
599a	Seq. ID No. 1299	Seq. ID No. 1300
599b	Seq. ID No. 1301	Seq. ID No. 1302

TABLE 20: WYETH ORFs

ORF Number	DNA SEQ ID Number	Protein SEQ ID Number
600a	Seq. ID No. 1303	Seq. ID No. 1304
600b	Seq. ID No. 1305	Seq. ID No. 1306
603a	Seq. ID No. 1307	Seq. ID No. 1308
606	Seq. ID No. 1309	Seq. ID No. 1310
607a	Seq. ID No. 1311	Seq. ID No. 1312
607b	Seq. ID No. 1313	Seq. ID No. 1314
609b	Seq. ID No. 1317	Seq. ID No. 1318
610a	Seq. ID No. 1319	Seq. ID No. 1320
610b	Seq. ID No. 1321	Seq. ID No. 1322
613d	Seq. ID No. 1331	Seq. ID No. 1332
614a	Seq. ID No. 1333	Seq. ID No. 1334
614b	Seq. ID No. 1335	Seq. ID No. 1336
615b	Seq. ID No. 1337	Seq. ID No. 1338
618	Seq. ID No. 1339	Seq. ID No. 1340
619b	Seq. ID No. 1343	Seq. ID No. 1344
620	Seq. ID No. 1345	Seq. ID No. 1346
623	Seq. ID No. 1347	Seq. ID No. 1348
624a	Seq. ID No. 1349	Seq. ID No. 1350
624b	Seq. ID No. 1351	Seq. ID No. 1352
626b	Seq. ID No. 1359	Seq. ID No. 1360
626c	Seq. ID No. 1361	Seq. ID No. 1362
631a	Seq. ID No. 1363	Seq. ID No. 1364
631b	Seq. ID No. 1365	Seq. ID No. 1366
631d	Seq. ID No. 1369	Seq. ID No. 1370
632b	Seq. ID No. 1371	Seq. ID No. 1372
633b	Seq. ID No. 1375	Seq. ID No. 1376
633c	Seq. ID No. 1377	Seq. ID No. 1378
636	Seq. ID No. 1381	Seq. ID No. 1382
637a	Seq. ID No. 1383	Seq. ID No. 1384

TABLE 20: WYETH ORFS

ORF Number	DNA SEQ ID Number	Protein SEQ ID Number
637b	Seq. ID No. 1385	Seq. ID No. 1386
637c	Seq. ID No. 1387	Seq. ID No. 1388
640	Seq. ID No. 1389	Seq. ID No. 1390
641a	Seq. ID No. 1391	Seq. ID No. 1392
641b	Seq. ID No. 1393	Seq. ID No. 1394
645	Seq. ID No. 1401	Seq. ID No. 1402
650	Seq. ID No. 1403	Seq. ID No. 1404
653a	Seq. ID No. 1407	Seq. ID No. 1408
653b	Seq. ID No. 1409	Seq. ID No. 1410
653c	Seq. ID No. 1411	Seq. ID No. 1412
656	Seq. ID No. 1413	Seq. ID No. 1414
657c	Seq. ID No. 1415	Seq. ID No. 1416
658b	Seq. ID No. 1419	Seq. ID No. 1420
659a	Seq. ID No. 1421	Seq. ID No. 1422
659b	Seq. ID No. 1423	Seq. ID No. 1424
661	Seq. ID No. 1425	Seq. ID No. 1426
663	Seq. ID No. 1427	Seq. ID No. 1428
665	Seq. ID No. 1429	Seq. ID No. 1430
670	Seq. ID No. 1433	Seq. ID No. 1434
674b	Seq. ID No. 1437	Seq. ID No. 1438
677a	Seq. ID No. 1441	Seq. ID No. 1442
677b	Seq. ID No. 1443	Seq. ID No. 1444
679b	Seq. ID No. 1447	Seq. ID No. 1448
680	Seq. ID No. 1449	Seq. ID No. 1450
681	Seq. ID No. 1451	Seq. ID No. 1452
683b	Seq. ID No. 1455	Seq. ID No. 1456
687	Seq. ID No. 1459	Seq. ID No. 1460
688b	Seq. ID No. 1463	Seq. ID No. 1464
690	Seq. ID No. 1465	Seq. ID No. 1466

TABLE 20: WYETH ORFS

ORF Number	DNA SEQ ID Number	Protein SEQ ID Number
691a	Seq. ID No. 1467	Seq. ID No. 1468
691b	Seq. ID No. 1469	Seq. ID No. 1470
692	Seq. ID No. 1471	Seq. ID No. 1472
694	Seq. ID No. 1473	Seq. ID No. 1474
696	Seq. ID No. 1475	Seq. ID No. 1476
698	Seq. ID No. 1477	Seq. ID No. 1478
699b	Seq. ID No. 1479	Seq. ID No. 1480
700b	Seq. ID No. 1483	Seq. ID No. 1484
700c	Seq. ID No. 1485	Seq. ID No. 1486
703	Seq. ID No. 1487	Seq. ID No. 1488
705b	Seq. ID No. 1491	Seq. ID No. 1492
707	Seq. ID No. 1493	Seq. ID No. 1494
709	Seq. ID No. 1495	Seq. ID No. 1496
710	Seq. ID No. 1497	Seq. ID No. 1498
712a	Seq. ID No. 1499	Seq. ID No. 1500
712b	Seq. ID No. 1501	Seq. ID No. 1502
715b	Seq. ID No. 1505	Seq. ID No. 1506
717	Seq. ID No. 1507	Seq. ID No. 1508
721	Seq. ID No. 1511	Seq. ID No. 1512
722c	Seq. ID No. 1517	Seq. ID No. 1518
724a	Seq. ID No. 1519	Seq. ID No. 1520
724c	Seq. ID No. 1523	Seq. ID No. 1524
724d	Seq. ID No. 1525	Seq. ID No. 1526
726	Seq. ID No. 1527	Seq. ID No. 1528
728b	Seq. ID No. 1531	Seq. ID No. 1532
730d	Seq. ID No. 1539	Seq. ID No. 1540
732	Seq. ID No. 1543	Seq. ID No. 1544
738c	Seq. ID No. 1549	Seq. ID No. 1550
739	Seq. ID No. 1551	Seq. ID No. 1552

TABLE 20: WYETH ORFS

ORF Number	DNA SEQ ID Number	Protein SEQ ID Number
740	Seq. ID No. 1553	Seq. ID No. 1554
741a	Seq. ID No. 1555	Seq. ID No. 1556
741b	Seq. ID No. 1557	Seq. ID No. 1558
743b	Seq. ID No. 1561	Seq. ID No. 1562
744	Seq. ID No. 1563	Seq. ID No. 1564
745a	Seq. ID No. 1565	Seq. ID No. 1566
745b	Seq. ID No. 1567	Seq. ID No. 1568
746b	Seq. ID No. 1571	Seq. ID No. 1572
747	Seq. ID No. 1573	Seq. ID No. 1574
748a	Seq. ID No. 1575	Seq. ID No. 1576
748b	Seq. ID No. 1577	Seq. ID No. 1578
749	Seq. ID No. 1579	Seq. ID No. 1580
751	Seq. ID No. 1581	Seq. ID No. 1582
754d	Seq. ID No. 1589	Seq. ID No. 1590
756b	Seq. ID No. 1593	Seq. ID No. 1594
758	Seq. ID No. 1595	Seq. ID No. 1596
760	Seq. ID No. 1597	Seq. ID No. 1598
762a	Seq. ID No. 1599	Seq. ID No. 1600
762b	Seq. ID No. 1601	Seq. ID No. 1602
763b	Seq. ID No. 1607	Seq. ID No. 1608
766	Seq. ID No. 1611	Seq. ID No. 1612
767	Seq. ID No. 1613	Seq. ID No. 1614
770a	Seq. ID No. 1615	Seq. ID No. 1616
770b	Seq. ID No. 1617	Seq. ID No. 1618
770c	Seq. ID No. 1619	Seq. ID No. 1620
772b	Seq. ID No. 1623	Seq. ID No. 1624
774	Seq. ID No. 1625	Seq. ID No. 1626
775	Seq. ID No. 1627	Seq. ID No. 1628
779	Seq. ID No. 1633	Seq. ID No. 1634

TABLE 20: WYETH ORFs

ORF Number	DNA SEQ ID Number	Protein SEQ ID Number
780b	Seq. ID No. 1637	Seq. ID No. 1638
782b	Seq. ID No. 1639	Seq. ID No. 1640
785	Seq. ID No. 1641	Seq. ID No. 1642
786b	Seq. ID No. 1643	Seq. ID No. 1644
788b	Seq. ID No. 1647	Seq. ID No. 1648
789b	Seq. ID No. 1651	Seq. ID No. 1652
789c	Seq. ID No. 1653	Seq. ID No. 1654
791	Seq. ID No. 1655	Seq. ID No. 1656
792	Seq. ID No. 1657	Seq. ID No. 1658
794b	Seq. ID No. 1661	Seq. ID No. 1662
794c	Seq. ID No. 1663	Seq. ID No. 1664
794d	Seq. ID No. 1665	Seq. ID No. 1666
797	Seq. ID No. 1669	Seq. ID No. 1670
799c	Seq. ID No. 1675	Seq. ID No. 1676
799e	Seq. ID No. 1679	Seq. ID No. 1680
799f	Seq. ID No. 1681	Seq. ID No. 1682
803b	Seq. ID No. 1685	Seq. ID No. 1686
804a	Seq. ID No. 1687	Seq. ID No. 1688
804b	Seq. ID No. 1689	Seq. ID No. 1690
807	Seq. ID No. 1691	Seq. ID No. 1692
808	Seq. ID No. 1693	Seq. ID No. 1694
809b	Seq. ID No. 1695	Seq. ID No. 1696
812	Seq. ID No. 1697	Seq. ID No. 1698
813	Seq. ID No. 1699	Seq. ID No. 1700
820a	Seq. ID No. 1703	Seq. ID No. 1704
820b	Seq. ID No. 1705	Seq. ID No. 1706
826	Seq. ID No. 1707	Seq. ID No. 1708
829b	Seq. ID No. 1711	Seq. ID No. 1712
830	Seq. ID No. 1713	Seq. ID No. 1714

TABLE 20: WYETH ORFS

ORF Number	DNA SEQ ID Number	Protein SEQ ID Number
834a	Seq. ID No. 1715	Seq. ID No. 1716
834b	Seq. ID No. 1717	Seq. ID No. 1718
834c	Seq. ID No. 1719	Seq. ID No. 1720
835a	Seq. ID No. 1721	Seq. ID No. 1722
835b	Seq. ID No. 1723	Seq. ID No. 1724
836b	Seq. ID No. 1727	Seq. ID No. 1728
836c	Seq. ID No. 1729	Seq. ID No. 1730
837c	Seq. ID No. 1735	Seq. ID No. 1736
843	Seq. ID No. 1737	Seq. ID No. 1738
847a	Seq. ID No. 1739	Seq. ID No. 1740
847b	Seq. ID No. 1741	Seq. ID No. 1742
849b	Seq. ID No. 1747	Seq. ID No. 1748
851a	Seq. ID No. 1749	Seq. ID No. 1750
851b	Seq. ID No. 1751	Seq. ID No. 1752
853b	Seq. ID No. 1755	Seq. ID No. 1756
853c	Seq. ID No. 1757	Seq. ID No. 1758
854	Seq. ID No. 1759	Seq. ID No. 1760
857	Seq. ID No. 1763	Seq. ID No. 1764
859c	Seq. ID No. 1769	Seq. ID No. 1770
859d	Seq. ID No. 1771	Seq. ID No. 1772
862	Seq. ID No. 1775	Seq. ID No. 1776
863	Seq. ID No. 1777	Seq. ID No. 1778
864a	Seq. ID No. 1779	Seq. ID No. 1780
864b	Seq. ID No. 1781	Seq. ID No. 1782
866a	Seq. ID No. 1783	Seq. ID No. 1784
866b	Seq. ID No. 1785	Seq. ID No. 1786
868b	Seq. ID No. 1789	Seq. ID No. 1790
870	Seq. ID No. 1791	Seq. ID No. 1792
873a	Seq. ID No. 1793	Seq. ID No. 1794

TABLE 20: WYETH ORFs

ORF Number	DNA SEQ ID Number	Protein SEQ ID Number
873b	Seq. ID No. 1795	Seq. ID No. 1796
873c	Seq. ID No. 1797	Seq. ID No. 1798
876	Seq. ID No. 1805	Seq. ID No. 1806
878b	Seq. ID No. 1809	Seq. ID No. 1810
878c	Seq. ID No. 1811	Seq. ID No. 1812
880a	Seq. ID No. 1813	Seq. ID No. 1814
880b	Seq. ID No. 1815	Seq. ID No. 1816
880c	Seq. ID No. 1817	Seq. ID No. 1818
885	Seq. ID No. 1819	Seq. ID No. 1820
886	Seq. ID No. 1821	Seq. ID No. 1822
887	Seq. ID No. 1823	Seq. ID No. 1824
888	Seq. ID No. 1825	Seq. ID No. 1826
890b	Seq. ID No. 1829	Seq. ID No. 1830
904	Seq. ID No. 1833	Seq. ID No. 1834
908b	Seq. ID No. 1841	Seq. ID No. 1842
908c	Seq. ID No. 1843	Seq. ID No. 1844
911	Seq. ID No. 1845	Seq. ID No. 1846
912	Seq. ID No. 1847	Seq. ID No. 1848
916	Seq. ID No. 1849	Seq. ID No. 1850
918b	Seq. ID No. 1853	Seq. ID No. 1854
918c	Seq. ID No. 1855	Seq. ID No. 1856
919	Seq. ID No. 1857	Seq. ID No. 1858
923	Seq. ID No. 1859	Seq. ID No. 1860
925a	Seq. ID No. 1861	Seq. ID No. 1862
925b	Seq. ID No. 1863	Seq. ID No. 1864
926	Seq. ID No. 1865	Seq. ID No. 1866
927	Seq. ID No. 1867	Seq. ID No. 1868
929b	Seq. ID No. 1871	Seq. ID No. 1872
930	Seq. ID No. 1873	Seq. ID No. 1874

TABLE 20: WYETH ORFS

ORF Number	DNA SEQ ID Number	Protein SEQ ID Number
931	Seq. ID No. 1875	Seq. ID No. 1876
932	Seq. ID No. 1877	Seq. ID No. 1878
934b	Seq. ID No. 1881	Seq. ID No. 1882
934c	Seq. ID No. 1883	Seq. ID No. 1884
934d	Seq. ID No. 1885	Seq. ID No. 1886
935	Seq. ID No. 1887	Seq. ID No. 1888
938	Seq. ID No. 1889	Seq. ID No. 1890
939c	Seq. ID No. 1895	Seq. ID No. 1896
944b	Seq. ID No. 1903	Seq. ID No. 1904
946	Seq. ID No. 1905	Seq. ID No. 1906
949a	Seq. ID No. 1907	Seq. ID No. 1908
949c	Seq. ID No. 1911	Seq. ID No. 1912
949d	Seq. ID No. 1913	Seq. ID No. 1914
950	Seq. ID No. 1915	Seq. ID No. 1916
951b	Seq. ID No. 1919	Seq. ID No. 1920
952b	Seq. ID No. 1923	Seq. ID No. 1924
954	Seq. ID No. 1925	Seq. ID No. 1926
955a	Seq. ID No. 1927	Seq. ID No. 1928
955b	Seq. ID No. 1929	Seq. ID No. 1930
956	Seq. ID No. 1931	Seq. ID No. 1932
958b	Seq. ID No. 1935	Seq. ID No. 1936
961b	Seq. ID No. 1941	Seq. ID No. 1942
961c	Seq. ID No. 1943	Seq. ID No. 1944
963	Seq. ID No. 1945	Seq. ID No. 1946
965a	Seq. ID No. 1947	Seq. ID No. 1948
965b	Seq. ID No. 1949	Seq. ID No. 1950
966a	Seq. ID No. 1951	Seq. ID No. 1952
966b	Seq. ID No. 1953	Seq. ID No. 1954
968	Seq. ID No. 1959	Seq. ID No. 1960

TABLE 20: WYETH ORFS

ORF Number	DNA SEQ ID Number	Protein SEQ ID Number
969	Seq. ID No. 1961	Seq. ID No. 1962
972a	Seq. ID No. 1963	Seq. ID No. 1964
972b	Seq. ID No. 1965	Seq. ID No. 1966
976	Seq. ID No. 1967	Seq. ID No. 1968
977a	Seq. ID No. 1969	Seq. ID No. 1970
977b	Seq. ID No. 1971	Seq. ID No. 1972
980	Seq. ID No. 1979	Seq. ID No. 1980
982	Seq. ID No. 1983	Seq. ID No. 1984
984a	Seq. ID No. 1985	Seq. ID No. 1986
984b	Seq. ID No. 1987	Seq. ID No. 1988
986	Seq. ID No. 1989	Seq. ID No. 1990
987	Seq. ID No. 1991	Seq. ID No. 1992
988b	Seq. ID No. 1995	Seq. ID No. 1996
988c	Seq. ID No. 1997	Seq. ID No. 1998
988d	Seq. ID No. 1999	Seq. ID No. 2000
991	Seq. ID No. 2001	Seq. ID No. 2002
992	Seq. ID No. 2003	Seq. ID No. 2004
993	Seq. ID No. 2005	Seq. ID No. 2006
994	Seq. ID No. 2007	Seq. ID No. 2008
998b	Seq. ID No. 2015	Seq. ID No. 2016
999b	Seq. ID No. 2019	Seq. ID No. 2020
1000	Seq. ID No. 2021	Seq. ID No. 2022
1003a	Seq. ID No. 2025	Seq. ID No. 2026
1003b	Seq. ID No. 2027	Seq. ID No. 2028
1004a	Seq. ID No. 2029	Seq. ID No. 2030
1004b	Seq. ID No. 2031	Seq. ID No. 2032
1006b	Seq. ID No. 2035	Seq. ID No. 2036
1007	Seq. ID No. 2037	Seq. ID No. 2038
1013a	Seq. ID No. 2041	Seq. ID No. 2042

TABLE 20: WYETH ORFs

ORF Number	DNA SEQ ID Number	Protein SEQ ID Number
1013b	Seq. ID No. 2043	Seq. ID No. 2044
1013c	Seq. ID No. 2045	Seq. ID No. 2046
1016c	Seq. ID No. 2047	Seq. ID No. 2048
1017c	Seq. ID No. 2053	Seq. ID No. 2054
1017d	Seq. ID No. 2055	Seq. ID No. 2056
1018b	Seq. ID No. 2059	Seq. ID No. 2060
1021b	Seq. ID No. 2063	Seq. ID No. 2064
1021c	Seq. ID No. 2065	Seq. ID No. 2066
1024	Seq. ID No. 2067	Seq. ID No. 2068
1025	Seq. ID No. 2069	Seq. ID No. 2070
1026	Seq. ID No. 2071	Seq. ID No. 2072
1029	Seq. ID No. 2073	Seq. ID No. 2074
1033a	Seq. ID No. 2075	Seq. ID No. 2076
1033b	Seq. ID No. 2077	Seq. ID No. 2078
1033c	Seq. ID No. 2079	Seq. ID No. 2080
1035a	Seq. ID No. 2081	Seq. ID No. 2082
1035b	Seq. ID No. 2083	Seq. ID No. 2084
1035c	Seq. ID No. 2085	Seq. ID No. 2086
1036b	Seq. ID No. 2089	Seq. ID No. 2090
1036c	Seq. ID No. 2091	Seq. ID No. 2092
1037	Seq. ID No. 2093	Seq. ID No. 2094
1039b	Seq. ID No. 2097	Seq. ID No. 2098
1041	Seq. ID No. 2099	Seq. ID No. 2100
1042a	Seq. ID No. 2101	Seq. ID No. 2102
1042b	Seq. ID No. 2103	Seq. ID No. 2104
1044b	Seq. ID No. 2107	Seq. ID No. 2108
1044c	Seq. ID No. 2109	Seq. ID No. 2110
1044d	Seq. ID No. 2111	Seq. ID No. 2112
1047b	Seq. ID No. 2115	Seq. ID No. 2116

TABLE 20: WYETH ORFs

ORF Number	DNA SEQ ID Number	Protein SEQ ID Number
1049a	Seq. ID No. 2117	Seq. ID No. 2118
1049b	Seq. ID No. 2119	Seq. ID No. 2120
1050c	Seq. ID No. 2125	Seq. ID No. 2126
1050d	Seq. ID No. 2127	Seq. ID No. 2128
1055	Seq. ID No. 2129	Seq. ID No. 2130
1056a	Seq. ID No. 2131	Seq. ID No. 2132
1056b	Seq. ID No. 2133	Seq. ID No. 2134
1057	Seq. ID No. 2135	Seq. ID No. 2136
1058	Seq. ID No. 2137	Seq. ID No. 2138
1060b	Seq. ID No. 2141	Seq. ID No. 2142
1062	Seq. ID No. 2143	Seq. ID No. 2144
1063	Seq. ID No. 2145	Seq. ID No. 2146
1065a	Seq. ID No. 2149	Seq. ID No. 2150
1065b	Seq. ID No. 2151	Seq. ID No. 2152
1065c	Seq. ID No. 2153	Seq. ID No. 2154
1066a	Seq. ID No. 2155	Seq. ID No. 2156
1066b	Seq. ID No. 2157	Seq. ID No. 2158
1067	Seq. ID No. 2159	Seq. ID No. 2160
1069	Seq. ID No. 2161	Seq. ID No. 2162
1070b	Seq. ID No. 2165	Seq. ID No. 2166
1076a	Seq. ID No. 2167	Seq. ID No. 2168
1076b	Seq. ID No. 2169	Seq. ID No. 2170
1077e	Seq. ID No. 2179	Seq. ID No. 2180
1079a	Seq. ID No. 2181	Seq. ID No. 2182
1079b	Seq. ID No. 2183	Seq. ID No. 2184
1081b	Seq. ID No. 2189	Seq. ID No. 2190
1082	Seq. ID No. 2191	Seq. ID No. 2192
1086	Seq. ID No. 2195	Seq. ID No. 2196
1087a	Seq. ID No. 2197	Seq. ID No. 2198

TABLE 20: WYETH ORFs

ORF Number	DNA SEQ ID Number	Protein SEQ ID Number
1087b	Seq. ID No. 2199	Seq. ID No. 2200
1091a	Seq. ID No. 2201	Seq. ID No. 2202
1091b	Seq. ID No. 2203	Seq. ID No. 2204
1094a	Seq. ID No. 2205	Seq. ID No. 2206
1094b	Seq. ID No. 2207	Seq. ID No. 2208
1095a	Seq. ID No. 2209	Seq. ID No. 2210
1095b	Seq. ID No. 2211	Seq. ID No. 2212
1096a	Seq. ID No. 2213	Seq. ID No. 2214
1096b	Seq. ID No. 2215	Seq. ID No. 2216
1096c	Seq. ID No. 2217	Seq. ID No. 2218
1098b	Seq. ID No. 2221	Seq. ID No. 2222
1100	Seq. ID No. 2223	Seq. ID No. 2224
1101b	Seq. ID No. 2227	Seq. ID No. 2228
1104	Seq. ID No. 2229	Seq. ID No. 2230
1108b	Seq. ID No. 2235	Seq. ID No. 2236
1111c	Seq. ID No. 2241	Seq. ID No. 2242
1125	Seq. ID No. 2245	Seq. ID No. 2246
1126a	Seq. ID No. 2247	Seq. ID No. 2248
1126c	Seq. ID No. 2251	Seq. ID No. 2252
1127	Seq. ID No. 2253	Seq. ID No. 2254
1131	Seq. ID No. 2257	Seq. ID No. 2258
1132	Seq. ID No. 2259	Seq. ID No. 2260
1135a	Seq. ID No. 2261	Seq. ID No. 2262
1135b	Seq. ID No. 2263	Seq. ID No. 2264
1136a	Seq. ID No. 2265	Seq. ID No. 2266
1136b	Seq. ID No. 2267	Seq. ID No. 2268
1138	Seq. ID No. 2269	Seq. ID No. 2270
1140c	Seq. ID No. 2275	Seq. ID No. 2276
1141a	Seq. ID No. 2277	Seq. ID No. 2278

TABLE 20: WYETH ORFS

ORF Number	DNA SEQ ID Number	Protein SEQ ID Number
1141b	Seq. ID No. 2279	Seq. ID No. 2280
1144b	Seq. ID No. 2285	Seq. ID No. 2286
1144c	Seq. ID No. 2287	Seq. ID No. 2288
1146e	Seq. ID No. 2297	Seq. ID No. 2298
1148	Seq. ID No. 2299	Seq. ID No. 2300
1149	Seq. ID No. 2301	Seq. ID No. 2302
1152d	Seq. ID No. 2309	Seq. ID No. 2310
1152e	Seq. ID No. 2311	Seq. ID No. 2312
1152g	Seq. ID No. 2315	Seq. ID No. 2316
1155f	Seq. ID No. 2327	Seq. ID No. 2328
1155g	Seq. ID No. 2329	Seq. ID No. 2330
1158b	Seq. ID No. 2333	Seq. ID No. 2334
1165	Seq. ID No. 2343	Seq. ID No. 2344
1166	Seq. ID No. 2345	Seq. ID No. 2346
1167b	Seq. ID No. 2349	Seq. ID No. 2350
1168	Seq. ID No. 2351	Seq. ID No. 2352
1169c	Seq. ID No. 2357	Seq. ID No. 2358
1171c	Seq. ID No. 2363	Seq. ID No. 2364
1172	Seq. ID No. 2365	Seq. ID No. 2366
1173	Seq. ID No. 2367	Seq. ID No. 2368
1174	Seq. ID No. 2369	Seq. ID No. 2370
1175	Seq. ID No. 2371	Seq. ID No. 2372
1177	Seq. ID No. 2373	Seq. ID No. 2374
1178	Seq. ID No. 2375	Seq. ID No. 2376
1179b	Seq. ID No. 2379	Seq. ID No. 2380
1179c	Seq. ID No. 2381	Seq. ID No. 2382
1180b	Seq. ID No. 2385	Seq. ID No. 2386
1180c	Seq. ID No. 2387	Seq. ID No. 2388
1180e	Seq. ID No. 2391	Seq. ID No. 2392

TABLE 20: WYETH ORFS

ORF Number	DNA SEQ ID Number	Protein SEQ ID Number
1182a	Seq. ID No. 2393	Seq. ID No. 2394
1182b	Seq. ID No. 2395	Seq. ID No. 2396
1183a	Seq. ID No. 2397	Seq. ID No. 2398
1183b	Seq. ID No. 2399	Seq. ID No. 2400
1184	Seq. ID No. 2401	Seq. ID No. 2402
1185b	Seq. ID No. 2405	Seq. ID No. 2406
1186b	Seq. ID No. 2409	Seq. ID No. 2410
1188b	Seq. ID No. 2413	Seq. ID No. 2414
1188c	Seq. ID No. 2415	Seq. ID No. 2416
1191	Seq. ID No. 2417	Seq. ID No. 2418
1192b	Seq. ID No. 2421	Seq. ID No. 2422
1194	Seq. ID No. 2423	Seq. ID No. 2424
1196a	Seq. ID No. 2425	Seq. ID No. 2426
1196b	Seq. ID No. 2427	Seq. ID No. 2428
1197	Seq. ID No. 2429	Seq. ID No. 2430
1199b	Seq. ID No. 2435	Seq. ID No. 2436
1200	Seq. ID No. 2437	Seq. ID No. 2438
1205	Seq. ID No. 2445	Seq. ID No. 2446
1206	Seq. ID No. 2447	Seq. ID No. 2448
1207	Seq. ID No. 2449	Seq. ID No. 2450
1208	Seq. ID No. 2451	Seq. ID No. 2452
1209	Seq. ID No. 2453	Seq. ID No. 2454
1210a	Seq. ID No. 2455	Seq. ID No. 2456
1210b	Seq. ID No. 2457	Seq. ID No. 2458
1212	Seq. ID No. 2459	Seq. ID No. 2460
1213a	Seq. ID No. 2461	Seq. ID No. 2462
1213b	Seq. ID No. 2463	Seq. ID No. 2464
1214	Seq. ID No. 2465	Seq. ID No. 2466
1215b	Seq. ID No. 2469	Seq. ID No. 2470

TABLE 20: WYETH ORFS

ORF Number	DNA SEQ ID Number	Protein SEQ ID Number
1217c	Seq. ID No. 2471	Seq. ID No. 2472
1218b	Seq. ID No. 2475	Seq. ID No. 2476
1221a	Seq. ID No. 2481	Seq. ID No. 2482
1221b	Seq. ID No. 2483	Seq. ID No. 2484
1223	Seq. ID No. 2485	Seq. ID No. 2486
1224c	Seq. ID No. 2491	Seq. ID No. 2492
1225	Seq. ID No. 2493	Seq. ID No. 2494
1226	Seq. ID No. 2495	Seq. ID No. 2496
1228b	Seq. ID No. 2499	Seq. ID No. 2500
1229b	Seq. ID No. 2501	Seq. ID No. 2502
1229c	Seq. ID No. 2503	Seq. ID No. 2504
1230	Seq. ID No. 2505	Seq. ID No. 2506
1231	Seq. ID No. 2507	Seq. ID No. 2508
1233b	Seq. ID No. 2511	Seq. ID No. 2512
1233c	Seq. ID No. 2513	Seq. ID No. 2514
1234b	Seq. ID No. 2517	Seq. ID No. 2518
1234c	Seq. ID No. 2519	Seq. ID No. 2520
1235	Seq. ID No. 2521	Seq. ID No. 2522
1237	Seq. ID No. 2525	Seq. ID No. 2526
1240	Seq. ID No. 2529	Seq. ID No. 2530
1241b	Seq. ID No. 2533	Seq. ID No. 2534
1241c	Seq. ID No. 2535	Seq. ID No. 2536
1243	Seq. ID No. 2537	Seq. ID No. 2538
1244	Seq. ID No. 2539	Seq. ID No. 2540
1245d	Seq. ID No. 2547	Seq. ID No. 2548
1245e	Seq. ID No. 2549	Seq. ID No. 2550
1246a	Seq. ID No. 2551	Seq. ID No. 2552
1246b	Seq. ID No. 2553	Seq. ID No. 2554
1250c	Seq. ID No. 2559	Seq. ID No. 2560

TABLE 20: WYETH ORFs

ORF Number	DNA SEQ ID Number	Protein SEQ ID Number
1250d	Seq. ID No. 2561	Seq. ID No. 2562
1250e	Seq. ID No. 2563	Seq. ID No. 2564
1251a	Seq. ID No. 2565	Seq. ID No. 2566
1253c	Seq. ID No. 2573	Seq. ID No. 2574
1253d	Seq. ID No. 2575	Seq. ID No. 2576
1256	Seq. ID No. 2577	Seq. ID No. 2578
1257a	Seq. ID No. 2579	Seq. ID No. 2580
1257b	Seq. ID No. 2581	Seq. ID No. 2582
1258c	Seq. ID No. 2587	Seq. ID No. 2588
1258d	Seq. ID No. 2589	Seq. ID No. 2590
1260	Seq. ID No. 2591	Seq. ID No. 2592
1263	Seq. ID No. 2593	Seq. ID No. 2594
1265	Seq. ID No. 2595	Seq. ID No. 2596
1266b	Seq. ID No. 2599	Seq. ID No. 2600
1267b	Seq. ID No. 2603	Seq. ID No. 2604
1268a	Seq. ID No. 2605	Seq. ID No. 2606
1268b	Seq. ID No. 2607	Seq. ID No. 2608
1269	Seq. ID No. 2609	Seq. ID No. 2610
1270	Seq. ID No. 2611	Seq. ID No. 2612
1271	Seq. ID No. 2613	Seq. ID No. 2614
1272b	Seq. ID No. 2617	Seq. ID No. 2618
1273	Seq. ID No. 2619	Seq. ID No. 2620
1275b	Seq. ID No. 2623	Seq. ID No. 2624
1277	Seq. ID No. 2625	Seq. ID No. 2626
1278a	Seq. ID No. 2627	Seq. ID No. 2628
1278b	Seq. ID No. 2629	Seq. ID No. 2630
1279	Seq. ID No. 2631	Seq. ID No. 2632
1281	Seq. ID No. 2633	Seq. ID No. 2634
1283a	Seq. ID No. 2635	Seq. ID No. 2636

TABLE 20: WYETH ORFs

ORF Number	DNA SEQ ID Number	Protein SEQ ID Number
1283b	Seq. ID No. 2637	Seq. ID No. 2638
1283c	Seq. ID No. 2639	Seq. ID No. 2640
1284	Seq. ID No. 2641	Seq. ID No. 2642
1285a	Seq. ID No. 2643	Seq. ID No. 2644
1285b	Seq. ID No. 2645	Seq. ID No. 2646
1287a	Seq. ID No. 2647	Seq. ID No. 2648
1287b	Seq. ID No. 2649	Seq. ID No. 2650
1288	Seq. ID No. 2651	Seq. ID No. 2652
1289	Seq. ID No. 2653	Seq. ID No. 2654
1290	Seq. ID No. 2655	Seq. ID No. 2656
1293b	Seq. ID No. 2659	Seq. ID No. 2660
1295	Seq. ID No. 2663	Seq. ID No. 2664
1297b	Seq. ID No. 2667	Seq. ID No. 2668
1300	Seq. ID No. 2669	Seq. ID No. 2670
1302	Seq. ID No. 2671	Seq. ID No. 2672
1305b	Seq. ID No. 2675	Seq. ID No. 2676
1305c	Seq. ID No. 2677	Seq. ID No. 2678
1308c	Seq. ID No. 2683	Seq. ID No. 2684
1308d	Seq. ID No. 2685	Seq. ID No. 2686
1308e	Seq. ID No. 2687	Seq. ID No. 2688
1311	Seq. ID No. 2689	Seq. ID No. 2690
1314b	Seq. ID No. 2691	Seq. ID No. 2692
1315	Seq. ID No. 2693	Seq. ID No. 2694
1316	Seq. ID No. 2695	Seq. ID No. 2696
1317	Seq. ID No. 2697	Seq. ID No. 2698
1318	Seq. ID No. 2699	Seq. ID No. 2700
1319b	Seq. ID No. 2703	Seq. ID No. 2704
1320c	Seq. ID No. 2709	Seq. ID No. 2710
1321	Seq. ID No. 2711	Seq. ID No. 2712

TABLE 20: WYETH ORFS

ORF Number	DNA SEQ ID Number	Protein SEQ ID Number
1322b	Seq. ID No. 2715	Seq. ID No. 2716
1323b	Seq. ID No. 2717	Seq. ID No. 2718
1324	Seq. ID No. 2719	Seq. ID No. 2720
1326b	Seq. ID No. 2723	Seq. ID No. 2724
1326c	Seq. ID No. 2725	Seq. ID No. 2726
1333	Seq. ID No. 2727	Seq. ID No. 2728
1334a	Seq. ID No. 2729	Seq. ID No. 2730
1334b	Seq. ID No. 2731	Seq. ID No. 2732
1335b	Seq. ID No. 2735	Seq. ID No. 2736
1337	Seq. ID No. 2737	Seq. ID No. 2738
1338	Seq. ID No. 2739	Seq. ID No. 2740
1344a	Seq. ID No. 2749	Seq. ID No. 2750
1344b	Seq. ID No. 2751	Seq. ID No. 2752
1348	Seq. ID No. 2753	Seq. ID No. 2754
1349a	Seq. ID No. 2755	Seq. ID No. 2756
1349c	Seq. ID No. 2759	Seq. ID No. 2760
1353	Seq. ID No. 2765	Seq. ID No. 2766
1355	Seq. ID No. 2767	Seq. ID No. 2768
1358a	Seq. ID No. 2769	Seq. ID No. 2770
1358b	Seq. ID No. 2771	Seq. ID No. 2772
1359	Seq. ID No. 2773	Seq. ID No. 2774
1361	Seq. ID No. 2775	Seq. ID No. 2776
1364b	Seq. ID No. 2779	Seq. ID No. 2780
1364c	Seq. ID No. 2781	Seq. ID No. 2782
1365b	Seq. ID No. 2783	Seq. ID No. 2784
1366b	Seq. ID No. 2787	Seq. ID No. 2788
1367	Seq. ID No. 2789	Seq. ID No. 2790
1368	Seq. ID No. 2791	Seq. ID No. 2792
1371	Seq. ID No. 2793	Seq. ID No. 2794

TABLE 20: WYETH ORFs

ORF Number	DNA SEQ ID Number	Protein SEQ ID Number
1373a	Seq. ID No. 2795	Seq. ID No. 2796
1373b	Seq. ID No. 2797	Seq. ID No. 2798
1374	Seq. ID No. 2799	Seq. ID No. 2800
1375	Seq. ID No. 2801	Seq. ID No. 2802
1377	Seq. ID No. 2803	Seq. ID No. 2804
1379	Seq. ID No. 2807	Seq. ID No. 2808
1380	Seq. ID No. 2809	Seq. ID No. 2810
1381b	Seq. ID No. 2813	Seq. ID No. 2814
1382	Seq. ID No. 2815	Seq. ID No. 2816
1384b	Seq. ID No. 2821	Seq. ID No. 2822
1384c	Seq. ID No. 2823	Seq. ID No. 2824
1386b	Seq. ID No. 2827	Seq. ID No. 2828
1387a	Seq. ID No. 2829	Seq. ID No. 2830
1388b	Seq. ID No. 2831	Seq. ID No. 2832
1389a	Seq. ID No. 2833	Seq. ID No. 2834
1393c	Seq. ID No. 2839	Seq. ID No. 2840
1393d	Seq. ID No. 2841	Seq. ID No. 2842
1394	Seq. ID No. 2843	Seq. ID No. 2844
1395a	Seq. ID No. 2845	Seq. ID No. 2846
1396	Seq. ID No. 2847	Seq. ID No. 2848
1399b	Seq. ID No. 2855	Seq. ID No. 2856
1402c	Seq. ID No. 2861	Seq. ID No. 2862
1405	Seq. ID No. 2863	Seq. ID No. 2864
1407b	Seq. ID No. 2865	Seq. ID No. 2866
1408	Seq. ID No. 2867	Seq. ID No. 2868
1409	Seq. ID No. 2869	Seq. ID No. 2870
1410	Seq. ID No. 2871	Seq. ID No. 2872
1411c	Seq. ID No. 2877	Seq. ID No. 2878
1412b	Seq. ID No. 2881	Seq. ID No. 2882

TABLE 20: WYETH ORFs

ORF Number	DNA SEQ ID Number	Protein SEQ ID Number
1414a	Seq. ID No. 2883	Seq. ID No. 2884
1414b	Seq. ID No. 2885	Seq. ID No. 2886
1414c	Seq. ID No. 2887	Seq. ID No. 2888
1416	Seq. ID No. 2891	Seq. ID No. 2892
1418	Seq. ID No. 2893	Seq. ID No. 2894
1419	Seq. ID No. 2895	Seq. ID No. 2896
1420b	Seq. ID No. 2899	Seq. ID No. 2900
1422	Seq. ID No. 2901	Seq. ID No. 2902
1426b	Seq. ID No. 2907	Seq. ID No. 2908
1429a	Seq. ID No. 2915	Seq. ID No. 2916
1429b	Seq. ID No. 2917	Seq. ID No. 2918
1431	Seq. ID No. 2919	Seq. ID No. 2920
1432	Seq. ID No. 2921	Seq. ID No. 2922
1433	Seq. ID No. 2923	Seq. ID No. 2924
1434b	Seq. ID No. 2927	Seq. ID No. 2928
1437b	Seq. ID No. 2931	Seq. ID No. 2932
1437c	Seq. ID No. 2933	Seq. ID No. 2934
1438	Seq. ID No. 2935	Seq. ID No. 2936
1439d	Seq. ID No. 2943	Seq. ID No. 2944
1439e	Seq. ID No. 2945	Seq. ID No. 2946
1440c	Seq. ID No. 2951	Seq. ID No. 2952
1440d	Seq. ID No. 2953	Seq. ID No. 2954
1442b	Seq. ID No. 2957	Seq. ID No. 2958
1445a	Seq. ID No. 2959	Seq. ID No. 2960
1445b	Seq. ID No. 2961	Seq. ID No. 2962
1445c	Seq. ID No. 2963	Seq. ID No. 2964
1446a	Seq. ID No. 2965	Seq. ID No. 2966
1446b	Seq. ID No. 2967	Seq. ID No. 2968
1447b	Seq. ID No. 2971	Seq. ID No. 2972

TABLE 20: WYETH ORFS

ORF Number	DNA SEQ ID Number	Protein SEQ ID Number
1448	Seq. ID No. 2973	Seq. ID No. 2974
1449a	Seq. ID No. 2975	Seq. ID No. 2976
1449b	Seq. ID No. 2977	Seq. ID No. 2978
1451	Seq. ID No. 2979	Seq. ID No. 2980
1452b	Seq. ID No. 2983	Seq. ID No. 2984
1453	Seq. ID No. 2985	Seq. ID No. 2986
1454	Seq. ID No. 2987	Seq. ID No. 2988
1455b	Seq. ID No. 2991	Seq. ID No. 2992
1456	Seq. ID No. 2993	Seq. ID No. 2994
1457c	Seq. ID No. 2999	Seq. ID No. 3000
1459	Seq. ID No. 3001	Seq. ID No. 3002
1462b	Seq. ID No. 3005	Seq. ID No. 3006
1463b	Seq. ID No. 3009	Seq. ID No. 3010
1463c	Seq. ID No. 3011	Seq. ID No. 3012
1466b	Seq. ID No. 3015	Seq. ID No. 3016
1466c	Seq. ID No. 3017	Seq. ID No. 3018
1466d	Seq. ID No. 3019	Seq. ID No. 3020
1467	Seq. ID No. 3021	Seq. ID No. 3022
1469c	Seq. ID No. 3027	Seq. ID No. 3028
1470c	Seq. ID No. 3033	Seq. ID No. 3034
1471	Seq. ID No. 3035	Seq. ID No. 3036
1472b	Seq. ID No. 3037	Seq. ID No. 3038
1472c	Seq. ID No. 3039	Seq. ID No. 3040
1475	Seq. ID No. 3043	Seq. ID No. 3044
1476	Seq. ID No. 3045	Seq. ID No. 3046
1477a	Seq. ID No. 3047	Seq. ID No. 3048
1477b	Seq. ID No. 3049	Seq. ID No. 3050
1479a	Seq. ID No. 3051	Seq. ID No. 3052
1479b	Seq. ID No. 3053	Seq. ID No. 3054

TABLE 20: WYETH ORFs

ORF Number	DNA SEQ ID Number	Protein SEQ ID Number
1479c	Seq. ID No. 3055	Seq. ID No. 3056
1482a	Seq. ID No. 3057	Seq. ID No. 3058
1482b	Seq. ID No. 3059	Seq. ID No. 3060
1484c	Seq. ID No. 3067	Seq. ID No. 3068
1486	Seq. ID No. 3069	Seq. ID No. 3070
1487	Seq. ID No. 3071	Seq. ID No. 3072
1488d	Seq. ID No. 3079	Seq. ID No. 3080
1488f	Seq. ID No. 3083	Seq. ID No. 3084
1488g	Seq. ID No. 3085	Seq. ID No. 3086
1489	Seq. ID No. 3087	Seq. ID No. 3088
1494	Seq. ID No. 3091	Seq. ID No. 3092
1497	Seq. ID No. 3093	Seq. ID No. 3094
1498c	Seq. ID No. 3099	Seq. ID No. 3100
1498d	Seq. ID No. 3101	Seq. ID No. 3102
1499	Seq. ID No. 3103	Seq. ID No. 3104
1503a	Seq. ID No. 3109	Seq. ID No. 3110
1503b	Seq. ID No. 3111	Seq. ID No. 3112
1506b	Seq. ID No. 3115	Seq. ID No. 3116
1506c	Seq. ID No. 3117	Seq. ID No. 3118
1507a	Seq. ID No. 3119	Seq. ID No. 3120
1507b	Seq. ID No. 3121	Seq. ID No. 3122
1507c	Seq. ID No. 3123	Seq. ID No. 3124
1508	Seq. ID No. 3125	Seq. ID No. 3126
1510b	Seq. ID No. 3129	Seq. ID No. 3130
1510c	Seq. ID No. 3131	Seq. ID No. 3132
1510d	Seq. ID No. 3133	Seq. ID No. 3134
1511	Seq. ID No. 3135	Seq. ID No. 3136
1512	Seq. ID No. 3137	Seq. ID No. 3138
1513a	Seq. ID No. 3139	Seq. ID No. 3140

TABLE 20: WYETH ORFs

ORF Number	DNA SEQ ID Number	Protein SEQ ID Number
1513b	Seq. ID No. 3141	Seq. ID No. 3142
1516	Seq. ID No. 3143	Seq. ID No. 3144
1517b	Seq. ID No. 3147	Seq. ID No. 3148
1517c	Seq. ID No. 3149	Seq. ID No. 3150
1518a	Seq. ID No. 3151	Seq. ID No. 3152
1518b	Seq. ID No. 3153	Seq. ID No. 3154
1520	Seq. ID No. 3155	Seq. ID No. 3156
1522	Seq. ID No. 3157	Seq. ID No. 3158
1523	Seq. ID No. 3159	Seq. ID No. 3160
1528	Seq. ID No. 3161	Seq. ID No. 3162
1530b	Seq. ID No. 3165	Seq. ID No. 3166
1533a	Seq. ID No. 3167	Seq. ID No. 3168
1534a	Seq. ID No. 3169	Seq. ID No. 3170
1534b	Seq. ID No. 3171	Seq. ID No. 3172
1535a	Seq. ID No. 3173	Seq. ID No. 3174
1537	Seq. ID No. 3179	Seq. ID No. 3180
1542	Seq. ID No. 3181	Seq. ID No. 3182
1543	Seq. ID No. 3183	Seq. ID No. 3184
1544	Seq. ID No. 3185	Seq. ID No. 3186
1547a	Seq. ID No. 3187	Seq. ID No. 3188
1547b	Seq. ID No. 3189	Seq. ID No. 3190
1548	Seq. ID No. 3191	Seq. ID No. 3192
1552	Seq. ID No. 3193	Seq. ID No. 3194
1553a	Seq. ID No. 3195	Seq. ID No. 3196
1553b	Seq. ID No. 3197	Seq. ID No. 3198
1554c	Seq. ID No. 3203	Seq. ID No. 3204
1555	Seq. ID No. 3205	Seq. ID No. 3206
1556a	Seq. ID No. 3207	Seq. ID No. 3208
1556b	Seq. ID No. 3209	Seq. ID No. 3210

TABLE 20: WYETH ORFs

ORF Number	DNA SEQ ID Number	Protein SEQ ID Number
1556c	Seq. ID No. 3211	Seq. ID No. 3212
1557c	Seq. ID No. 3217	Seq. ID No. 3218
1563	Seq. ID No. 3223	Seq. ID No. 3224
1564a	Seq. ID No. 3225	Seq. ID No. 3226
1564b	Seq. ID No. 3227	Seq. ID No. 3228
1565	Seq. ID No. 3229	Seq. ID No. 3230
1569	Seq. ID No. 3235	Seq. ID No. 3236
1572e	Seq. ID No. 3249	Seq. ID No. 3250
1573	Seq. ID No. 3251	Seq. ID No. 3252
1576	Seq. ID No. 3253	Seq. ID No. 3254
1577a	Seq. ID No. 3255	Seq. ID No. 3256
1577b	Seq. ID No. 3257	Seq. ID No. 3258
1578	Seq. ID No. 3259	Seq. ID No. 3260
1580b	Seq. ID No. 3263	Seq. ID No. 3264
1581	Seq. ID No. 3265	Seq. ID No. 3266
1582b	Seq. ID No. 3269	Seq. ID No. 3270
1582c	Seq. ID No. 3271	Seq. ID No. 3272
1584	Seq. ID No. 3273	Seq. ID No. 3274
1585b	Seq. ID No. 3277	Seq. ID No. 3278
1587b	Seq. ID No. 3281	Seq. ID No. 3282
1587c	Seq. ID No. 3283	Seq. ID No. 3284
1588	Seq. ID No. 3285	Seq. ID No. 3286
1591	Seq. ID No. 3289	Seq. ID No. 3290
1592a	Seq. ID No. 3291	Seq. ID No. 3292
1592b	Seq. ID No. 3293	Seq. ID No. 3294
1594b	Seq. ID No. 3299	Seq. ID No. 3300
1595a	Seq. ID No. 3301	Seq. ID No. 3302
1595b	Seq. ID No. 3303	Seq. ID No. 3304
1598a	Seq. ID No. 3305	Seq. ID No. 3306

TABLE 20: WYETH ORFs

ORF Number	DNA SEQ ID Number	Protein SEQ ID Number
1598b	Seq. ID No. 3307	Seq. ID No. 3308
1600a	Seq. ID No. 3309	Seq. ID No. 3310
1600b	Seq. ID No. 3311	Seq. ID No. 3312
1600c	Seq. ID No. 3313	Seq. ID No. 3314
1602	Seq. ID No. 3315	Seq. ID No. 3316
1606b	Seq. ID No. 3319	Seq. ID No. 3320
1607a	Seq. ID No. 3321	Seq. ID No. 3322
1607b	Seq. ID No. 3323	Seq. ID No. 3324
1608	Seq. ID No. 3325	Seq. ID No. 3326
1612	Seq. ID No. 3331	Seq. ID No. 3332
1616b	Seq. ID No. 3335	Seq. ID No. 3336
1619	Seq. ID No. 3337	Seq. ID No. 3338
1621	Seq. ID No. 3339	Seq. ID No. 3340
1622a	Seq. ID No. 3341	Seq. ID No. 3342
1623b	Seq. ID No. 3345	Seq. ID No. 3346
1623c	Seq. ID No. 3347	Seq. ID No. 3348
1624	Seq. ID No. 3349	Seq. ID No. 3350
1625b	Seq. ID No. 3353	Seq. ID No. 3354
1625c	Seq. ID No. 3355	Seq. ID No. 3356
1626b	Seq. ID No. 3359	Seq. ID No. 3360
1628a	Seq. ID No. 3361	Seq. ID No. 3362
1628b	Seq. ID No. 3363	Seq. ID No. 3364
1632a	Seq. ID No. 3365	Seq. ID No. 3366
1632b	Seq. ID No. 3367	Seq. ID No. 3368
1633a	Seq. ID No. 3369	Seq. ID No. 3370
1633b	Seq. ID No. 3371	Seq. ID No. 3372
1634a	Seq. ID No. 3373	Seq. ID No. 3374
1634b	Seq. ID No. 3375	Seq. ID No. 3376
1634c	Seq. ID No. 3377	Seq. ID No. 3378

TABLE 20: WYETH ORFs

ORF Number	DNA SEQ ID Number	Protein SEQ ID Number
1639b	Seq. ID No. 3379	Seq. ID No. 3380
1642a	Seq. ID No. 3381	Seq. ID No. 3382
1642b	Seq. ID No. 3383	Seq. ID No. 3384
1646e	Seq. ID No. 3397	Seq. ID No. 3398
1646f	Seq. ID No. 3399	Seq. ID No. 3400
1647	Seq. ID No. 3401	Seq. ID No. 3402
1649b	Seq. ID No. 3407	Seq. ID No. 3408
1649c	Seq. ID No. 3409	Seq. ID No. 3410
1652b	Seq. ID No. 3413	Seq. ID No. 3414
1654	Seq. ID No. 3415	Seq. ID No. 3416
1657	Seq. ID No. 3419	Seq. ID No. 3420
1659c	Seq. ID No. 3425	Seq. ID No. 3426
1660b	Seq. ID No. 3427	Seq. ID No. 3428
1662b	Seq. ID No. 3431	Seq. ID No. 3432
1663	Seq. ID No. 3433	Seq. ID No. 3434
1664	Seq. ID No. 3435	Seq. ID No. 3436
1668	Seq. ID No. 3439	Seq. ID No. 3440
1669	Seq. ID No. 3441	Seq. ID No. 3442
1670a	Seq. ID No. 3443	Seq. ID No. 3444
1670b	Seq. ID No. 3445	Seq. ID No. 3446
1670c	Seq. ID No. 3447	Seq. ID No. 3448
1673d	Seq. ID No. 3455	Seq. ID No. 3456
1673e	Seq. ID No. 3457	Seq. ID No. 3458
1673f	Seq. ID No. 3459	Seq. ID No. 3460
1674	Seq. ID No. 3461	Seq. ID No. 3462
1675b	Seq. ID No. 3465	Seq. ID No. 3466
1675c	Seq. ID No. 3467	Seq. ID No. 3468
1677	Seq. ID No. 3471	Seq. ID No. 3472
1679	Seq. ID No. 3473	Seq. ID No. 3474

TABLE 20: WYETH ORFS

ORF Number	DNA SEQ ID Number	Protein SEQ ID Number
1680	Seq. ID No. 3475	Seq. ID No. 3476
1682b	Seq. ID No. 3479	Seq. ID No. 3480
1683b	Seq. ID No. 3483	Seq. ID No. 3484
1684	Seq. ID No. 3485	Seq. ID No. 3486
1685	Seq. ID No. 3487	Seq. ID No. 3488
1687	Seq. ID No. 3489	Seq. ID No. 3490
1688c	Seq. ID No. 3495	Seq. ID No. 3496
1689a	Seq. ID No. 3497	Seq. ID No. 3498
1689b	Seq. ID No. 3499	Seq. ID No. 3500
1689c	Seq. ID No. 3501	Seq. ID No. 3502
1690b	Seq. ID No. 3505	Seq. ID No. 3506
1691	Seq. ID No. 3507	Seq. ID No. 3508
1692	Seq. ID No. 3509	Seq. ID No. 3510
1693	Seq. ID No. 3511	Seq. ID No. 3512
1694a	Seq. ID No. 3513	Seq. ID No. 3514
1694c	Seq. ID No. 3517	Seq. ID No. 3518
1694d	Seq. ID No. 3519	Seq. ID No. 3520
1696	Seq. ID No. 3521	Seq. ID No. 3522
1697b	Seq. ID No. 3525	Seq. ID No. 3526
1699b	Seq. ID No. 3529	Seq. ID No. 3530
1700a	Seq. ID No. 3531	Seq. ID No. 3532
1700b	Seq. ID No. 3533	Seq. ID No. 3534
1701a	Seq. ID No. 3535	Seq. ID No. 3536
1701b	Seq. ID No. 3537	Seq. ID No. 3538
1703b	Seq. ID No. 3539	Seq. ID No. 3540
1704a	Seq. ID No. 3541	Seq. ID No. 3542
1704b	Seq. ID No. 3543	Seq. ID No. 3544
1705a	Seq. ID No. 3545	Seq. ID No. 3546
1705b	Seq. ID No. 3547	Seq. ID No. 3548

TABLE 20: WYETH ORFS

ORF Number	DNA SEQ ID Number	Protein SEQ ID Number
1706	Seq. ID No. 3549	Seq. ID No. 3550
1707a	Seq. ID No. 3551	Seq. ID No. 3552
1707b	Seq. ID No. 3553	Seq. ID No. 3554
1708	Seq. ID No. 3555	Seq. ID No. 3556
1709	Seq. ID No. 3557	Seq. ID No. 3558
1710a	Seq. ID No. 3559	Seq. ID No. 3560
1710b	Seq. ID No. 3561	Seq. ID No. 3562
1712a	Seq. ID No. 3563	Seq. ID No. 3564
1712b	Seq. ID No. 3565	Seq. ID No. 3566
1715a	Seq. ID No. 3567	Seq. ID No. 3568
1715b	Seq. ID No. 3569	Seq. ID No. 3570
1718a	Seq. ID No. 3571	Seq. ID No. 3572
1718b	Seq. ID No. 3573	Seq. ID No. 3574
1722	Seq. ID No. 3575	Seq. ID No. 3576
1723b	Seq. ID No. 3579	Seq. ID No. 3580
1724	Seq. ID No. 3581	Seq. ID No. 3582
1727	Seq. ID No. 3583	Seq. ID No. 3584
1731	Seq. ID No. 3587	Seq. ID No. 3588
1733	Seq. ID No. 3589	Seq. ID No. 3590
1735b	Seq. ID No. 3595	Seq. ID No. 3596
1737a	Seq. ID No. 3597	Seq. ID No. 3598
1737b	Seq. ID No. 3599	Seq. ID No. 3600
1738b	Seq. ID No. 3603	Seq. ID No. 3604
1738c	Seq. ID No. 3605	Seq. ID No. 3606
1739	Seq. ID No. 3607	Seq. ID No. 3608
1741	Seq. ID No. 3609	Seq. ID No. 3610
1743	Seq. ID No. 3611	Seq. ID No. 3612
1744a	Seq. ID No. 3613	Seq. ID No. 3614
1744b	Seq. ID No. 3615	Seq. ID No. 3616

TABLE 20: WYETH ORFs

ORF Number	DNA SEQ ID Number	Protein SEQ ID Number
1745	Seq. ID No. 3617	Seq. ID No. 3618
1747	Seq. ID No. 3619	Seq. ID No. 3620
1749a	Seq. ID No. 3621	Seq. ID No. 3622
1749b	Seq. ID No. 3623	Seq. ID No. 3624
1752a	Seq. ID No. 3627	Seq. ID No. 3628
1752b	Seq. ID No. 3629	Seq. ID No. 3630
1756b	Seq. ID No. 3635	Seq. ID No. 3636
1757a	Seq. ID No. 3637	Seq. ID No. 3638
1757b	Seq. ID No. 3639	Seq. ID No. 3640
1759	Seq. ID No. 3641	Seq. ID No. 3642
1762	Seq. ID No. 3645	Seq. ID No. 3646
1764a	Seq. ID No. 3647	Seq. ID No. 3648
1764b	Seq. ID No. 3649	Seq. ID No. 3650
1764c	Seq. ID No. 3651	Seq. ID No. 3652
1765	Seq. ID No. 3653	Seq. ID No. 3654
1767a	Seq. ID No. 3657	Seq. ID No. 3658
1767b	Seq. ID No. 3659	Seq. ID No. 3660
1769b	Seq. ID No. 3663	Seq. ID No. 3664
1771	Seq. ID No. 3665	Seq. ID No. 3666
1773	Seq. ID No. 3667	Seq. ID No. 3668
1775a	Seq. ID No. 3671	Seq. ID No. 3672
1775b	Seq. ID No. 3673	Seq. ID No. 3674
1775c	Seq. ID No. 3675	Seq. ID No. 3676
1778a	Seq. ID No. 3677	Seq. ID No. 3678
1778b	Seq. ID No. 3679	Seq. ID No. 3680
1780	Seq. ID No. 3681	Seq. ID No. 3682
1783a	Seq. ID No. 3683	Seq. ID No. 3684
1783b	Seq. ID No. 3685	Seq. ID No. 3686
1784a	Seq. ID No. 3687	Seq. ID No. 3688

TABLE 20: WYETH ORFs

ORF Number	DNA SEQ ID Number	Protein SEQ ID Number
1784b	Seq. ID No. 3689	Seq. ID No. 3690
1788a	Seq. ID No. 3691	Seq. ID No. 3692
1788b	Seq. ID No. 3693	Seq. ID No. 3694
1788c	Seq. ID No. 3695	Seq. ID No. 3696
1789b	Seq. ID No. 3699	Seq. ID No. 3700
1790a	Seq. ID No. 3701	Seq. ID No. 3702
1790b	Seq. ID No. 3703	Seq. ID No. 3704
1792a	Seq. ID No. 3705	Seq. ID No. 3706
1792b	Seq. ID No. 3707	Seq. ID No. 3708
1792c	Seq. ID No. 3709	Seq. ID No. 3710
1793b	Seq. ID No. 3713	Seq. ID No. 3714
1793c	Seq. ID No. 3715	Seq. ID No. 3716
1794a	Seq. ID No. 3717	Seq. ID No. 3718
1798c	Seq. ID No. 3727	Seq. ID No. 3728
1800	Seq. ID No. 3729	Seq. ID No. 3730
1802b	Seq. ID No. 3733	Seq. ID No. 3734
1804a	Seq. ID No. 3737	Seq. ID No. 3738
1804b	Seq. ID No. 3739	Seq. ID No. 3740
1805	Seq. ID No. 3741	Seq. ID No. 3742
1806b	Seq. ID No. 3745	Seq. ID No. 3746
1806c	Seq. ID No. 3747	Seq. ID No. 3748
1808d	Seq. ID No. 3759	Seq. ID No. 3760
1809d	Seq. ID No. 3767	Seq. ID No. 3768
1809e	Seq. ID No. 3769	Seq. ID No. 3770
1809f	Seq. ID No. 3771	Seq. ID No. 3772
1811b	Seq. ID No. 3779	Seq. ID No. 3780
1812b	Seq. ID No. 3783	Seq. ID No. 3784
1813	Seq. ID No. 3785	Seq. ID No. 3786
1815b	Seq. ID No. 3789	Seq. ID No. 3790

TABLE 20: WYETH ORFs

ORF Number	DNA SEQ ID Number	Protein SEQ ID Number
1815c	Seq. ID No. 3791	Seq. ID No. 3792
1816b	Seq. ID No. 3795	Seq. ID No. 3796
1816c	Seq. ID No. 3797	Seq. ID No. 3798
1819b	Seq. ID No. 3803	Seq. ID No. 3804
1821	Seq. ID No. 3805	Seq. ID No. 3806
1822	Seq. ID No. 3807	Seq. ID No. 3808
1823a	Seq. ID No. 3809	Seq. ID No. 3810
1823b	Seq. ID No. 3811	Seq. ID No. 3812
1825	Seq. ID No. 3813	Seq. ID No. 3814
1826a	Seq. ID No. 3815	Seq. ID No. 3816
1826b	Seq. ID No. 3817	Seq. ID No. 3818
1828	Seq. ID No. 3819	Seq. ID No. 3820
1830b	Seq. ID No. 3823	Seq. ID No. 3824
1833	Seq. ID No. 3825	Seq. ID No. 3826
1836a	Seq. ID No. 3831	Seq. ID No. 3832
1836b	Seq. ID No. 3833	Seq. ID No. 3834
1837	Seq. ID No. 3835	Seq. ID No. 3836
1838c	Seq. ID No. 3841	Seq. ID No. 3842
1838d	Seq. ID No. 3843	Seq. ID No. 3844
1839b	Seq. ID No. 3847	Seq. ID No. 3848
1842d	Seq. ID No. 3855	Seq. ID No. 3856
1843	Seq. ID No. 3857	Seq. ID No. 3858
1845c	Seq. ID No. 3863	Seq. ID No. 3864
1848b	Seq. ID No. 3867	Seq. ID No. 3868
1850b	Seq. ID No. 3871	Seq. ID No. 3872
1850c	Seq. ID No. 3873	Seq. ID No. 3874
1853a	Seq. ID No. 3875	Seq. ID No. 3876
1853b	Seq. ID No. 3877	Seq. ID No. 3878
1854b	Seq. ID No. 3881	Seq. ID No. 3882

TABLE 20: WYETH ORFs

ORF Number	DNA SEQ ID Number	Protein SEQ ID Number
1855	Seq. ID No. 3883	Seq. ID No. 3884
1856	Seq. ID No. 3885	Seq. ID No. 3886
1857d	Seq. ID No. 3893	Seq. ID No. 3894
1858	Seq. ID No. 3895	Seq. ID No. 3896
1861a	Seq. ID No. 3899	Seq. ID No. 3900
1861b	Seq. ID No. 3901	Seq. ID No. 3902
1863a	Seq. ID No. 3905	Seq. ID No. 3906
1863b	Seq. ID No. 3907	Seq. ID No. 3908
1865a	Seq. ID No. 3911	Seq. ID No. 3912
1865b	Seq. ID No. 3913	Seq. ID No. 3914
1868	Seq. ID No. 3915	Seq. ID No. 3916
1870	Seq. ID No. 3919	Seq. ID No. 3920
1873a	Seq. ID No. 3921	Seq. ID No. 3922
1873b	Seq. ID No. 3923	Seq. ID No. 3924
1873c	Seq. ID No. 3925	Seq. ID No. 3926
1875b	Seq. ID No. 3927	Seq. ID No. 3928
1875c	Seq. ID No. 3929	Seq. ID No. 3930
1877a	Seq. ID No. 3931	Seq. ID No. 3932
1877b	Seq. ID No. 3933	Seq. ID No. 3934
1878	Seq. ID No. 3935	Seq. ID No. 3936
1882	Seq. ID No. 3939	Seq. ID No. 3940
1884	Seq. ID No. 3941	Seq. ID No. 3942
1886	Seq. ID No. 3943	Seq. ID No. 3944
1887	Seq. ID No. 3945	Seq. ID No. 3946
1888a	Seq. ID No. 3947	Seq. ID No. 3948
1888b	Seq. ID No. 3949	Seq. ID No. 3950
1890	Seq. ID No. 3951	Seq. ID No. 3952
1891a	Seq. ID No. 3953	Seq. ID No. 3954
1891b	Seq. ID No. 3955	Seq. ID No. 3956

TABLE 20: WYETH ORFS

ORF Number	DNA SEQ ID Number	Protein SEQ ID Number
1893	Seq. ID No. 3957	Seq. ID No. 3958
1894c	Seq. ID No. 3959	Seq. ID No. 3960
1895	Seq. ID No. 3961	Seq. ID No. 3962
1896b	Seq. ID No. 3965	Seq. ID No. 3966
1897a	Seq. ID No. 3967	Seq. ID No. 3968
1897b	Seq. ID No. 3969	Seq. ID No. 3970
1897c	Seq. ID No. 3971	Seq. ID No. 3972
1898b	Seq. ID No. 3975	Seq. ID No. 3976
1900	Seq. ID No. 3979	Seq. ID No. 3980
1902a	Seq. ID No. 3981	Seq. ID No. 3982
1902b	Seq. ID No. 3983	Seq. ID No. 3984
1907	Seq. ID No. 3985	Seq. ID No. 3986
1912	Seq. ID No. 3987	Seq. ID No. 3988
1915b	Seq. ID No. 3991	Seq. ID No. 3992
1917a	Seq. ID No. 3995	Seq. ID No. 3996
1917b	Seq. ID No. 3997	Seq. ID No. 3998
1918b	Seq. ID No. 3999	Seq. ID No. 4000
1918d	Seq. ID No. 4003	Seq. ID No. 4004
1919b	Seq. ID No. 4007	Seq. ID No. 4008
1919c	Seq. ID No. 4009	Seq. ID No. 4010
1925	Seq. ID No. 4015	Seq. ID No. 4016
1926	Seq. ID No. 4017	Seq. ID No. 4018
1927b	Seq. ID No. 4021	Seq. ID No. 4022
1930	Seq. ID No. 4023	Seq. ID No. 4024
1931c	Seq. ID No. 4029	Seq. ID No. 4030
1933b	Seq. ID No. 4035	Seq. ID No. 4036
1934	Seq. ID No. 4037	Seq. ID No. 4038
1936	Seq. ID No. 4039	Seq. ID No. 4040
1937e	Seq. ID No. 4049	Seq. ID No. 4050

TABLE 20: WYETH ORFs

ORF Number	DNA SEQ ID Number	Protein SEQ ID Number
1939a	Seq. ID No. 4051	Seq. ID No. 4052
1939b	Seq. ID No. 4053	Seq. ID No. 4054
1939c	Seq. ID No. 4055	Seq. ID No. 4056
1940	Seq. ID No. 4057	Seq. ID No. 4058
1941b	Seq. ID No. 4061	Seq. ID No. 4062
1946c	Seq. ID No. 4075	Seq. ID No. 4076
1950	Seq. ID No. 4079	Seq. ID No. 4080
1951c	Seq. ID No. 4085	Seq. ID No. 4086
1951d	Seq. ID No. 4087	Seq. ID No. 4088
1953	Seq. ID No. 4089	Seq. ID No. 4090
1954a	Seq. ID No. 4091	Seq. ID No. 4092
1954b	Seq. ID No. 4093	Seq. ID No. 4094
1954c	Seq. ID No. 4095	Seq. ID No. 4096
1957	Seq. ID No. 4099	Seq. ID No. 4100
1958c	Seq. ID No. 4105	Seq. ID No. 4106
1960a	Seq. ID No. 4107	Seq. ID No. 4108
1960b	Seq. ID No. 4109	Seq. ID No. 4110
1960c	Seq. ID No. 4111	Seq. ID No. 4112
1961	Seq. ID No. 4113	Seq. ID No. 4114
1962b	Seq. ID No. 4117	Seq. ID No. 4118
1965a	Seq. ID No. 4119	Seq. ID No. 4120
1965b	Seq. ID No. 4121	Seq. ID No. 4122
1966	Seq. ID No. 4123	Seq. ID No. 4124
1967	Seq. ID No. 4125	Seq. ID No. 4126
1968	Seq. ID No. 4127	Seq. ID No. 4128
1969	Seq. ID No. 4129	Seq. ID No. 4130
1970a	Seq. ID No. 4131	Seq. ID No. 4132
1970b	Seq. ID No. 4133	Seq. ID No. 4134
1972	Seq. ID No. 4135	Seq. ID No. 4136

TABLE 20: WYETH ORFs

ORF Number	DNA SEQ ID Number	Protein SEQ ID Number
1973	Seq. ID No. 4137	Seq. ID No. 4138
1976	Seq. ID No. 4139	Seq. ID No. 4140
1977a	Seq. ID No. 4141	Seq. ID No. 4142
1977b	Seq. ID No. 4143	Seq. ID No. 4144
1977c	Seq. ID No. 4145	Seq. ID No. 4146
1979b	Seq. ID No. 4149	Seq. ID No. 4150
1980b	Seq. ID No. 4153	Seq. ID No. 4154
1981	Seq. ID No. 4155	Seq. ID No. 4156
1982	Seq. ID No. 4157	Seq. ID No. 4158
1985b	Seq. ID No. 4161	Seq. ID No. 4162
1986	Seq. ID No. 4163	Seq. ID No. 4164
1987b	Seq. ID No. 4167	Seq. ID No. 4168
1989b	Seq. ID No. 4171	Seq. ID No. 4172
1989c	Seq. ID No. 4173	Seq. ID No. 4174
1990a	Seq. ID No. 4175	Seq. ID No. 4176
1990b	Seq. ID No. 4177	Seq. ID No. 4178
1990c	Seq. ID No. 4179	Seq. ID No. 4180
1991	Seq. ID No. 4181	Seq. ID No. 4182
1992b	Seq. ID No. 4185	Seq. ID No. 4186
1993a	Seq. ID No. 4187	Seq. ID No. 4188
1993b	Seq. ID No. 4189	Seq. ID No. 4190
1993c	Seq. ID No. 4191	Seq. ID No. 4192
1996	Seq. ID No. 4193	Seq. ID No. 4194
2000	Seq. ID No. 4195	Seq. ID No. 4196
2001	Seq. ID No. 4197	Seq. ID No. 4198
2003	Seq. ID No. 4199	Seq. ID No. 4200
2008	Seq. ID No. 4203	Seq. ID No. 4204
2010	Seq. ID No. 4205	Seq. ID No. 4206
2011a	Seq. ID No. 4207	Seq. ID No. 4208

TABLE 20: WYETH ORFs

ORF Number	DNA SEQ ID Number	Protein SEQ ID Number
2011b	Seq. ID No. 4209	Seq. ID No. 4210
2011c	Seq. ID No. 4211	Seq. ID No. 4212
2015	Seq. ID No. 4219	Seq. ID No. 4220
2016e	Seq. ID No. 4229	Seq. ID No. 4230
2016g	Seq. ID No. 4233	Seq. ID No. 4234
2016h	Seq. ID No. 4235	Seq. ID No. 4236
2020	Seq. ID No. 4237	Seq. ID No. 4238
2021	Seq. ID No. 4239	Seq. ID No. 4240
2023b	Seq. ID No. 4243	Seq. ID No. 4244
2024c	Seq. ID No. 4249	Seq. ID No. 4250
2024d	Seq. ID No. 4251	Seq. ID No. 4252
2025	Seq. ID No. 4253	Seq. ID No. 4254
2027	Seq. ID No. 4255	Seq. ID No. 4256
2030b	Seq. ID No. 4259	Seq. ID No. 4260
2030d	Seq. ID No. 4263	Seq. ID No. 4264
2032c	Seq. ID No. 4265	Seq. ID No. 4266
2033	Seq. ID No. 4267	Seq. ID No. 4268
2035b	Seq. ID No. 4269	Seq. ID No. 4270
2036	Seq. ID No. 4271	Seq. ID No. 4272
2037	Seq. ID No. 4273	Seq. ID No. 4274
2038a	Seq. ID No. 4275	Seq. ID No. 4276
2043b	Seq. ID No. 4281	Seq. ID No. 4282
2044	Seq. ID No. 4283	Seq. ID No. 4284
2045a	Seq. ID No. 4285	Seq. ID No. 4286
2045b	Seq. ID No. 4287	Seq. ID No. 4288
2046a	Seq. ID No. 4289	Seq. ID No. 4290
2046b	Seq. ID No. 4291	Seq. ID No. 4292
2047a	Seq. ID No. 4293	Seq. ID No. 4294
2047b	Seq. ID No. 4295	Seq. ID No. 4296

TABLE 20: WYETH ORFS

ORF Number	DNA SEQ ID Number	Protein SEQ ID Number
2049c	Seq. ID No. 4297	Seq. ID No. 4298
2050	Seq. ID No. 4299	Seq. ID No. 4300
2053	Seq. ID No. 4301	Seq. ID No. 4302
2054	Seq. ID No. 4303	Seq. ID No. 4304
2056	Seq. ID No. 4307	Seq. ID No. 4308
2057	Seq. ID No. 4309	Seq. ID No. 4310
2059b	Seq. ID No. 4313	Seq. ID No. 4314
2060a	Seq. ID No. 4315	Seq. ID No. 4316
2060b	Seq. ID No. 4317	Seq. ID No. 4318
2062a	Seq. ID No. 4319	Seq. ID No. 4320
2062b	Seq. ID No. 4321	Seq. ID No. 4322
2062c	Seq. ID No. 4323	Seq. ID No. 4324
2064	Seq. ID No. 4325	Seq. ID No. 4326
2065b	Seq. ID No. 4329	Seq. ID No. 4330
2066	Seq. ID No. 4331	Seq. ID No. 4332
2068	Seq. ID No. 4333	Seq. ID No. 4334
2069a	Seq. ID No. 4335	Seq. ID No. 4336
2069b	Seq. ID No. 4337	Seq. ID No. 4338
2069c	Seq. ID No. 4339	Seq. ID No. 4340
2074b	Seq. ID No. 4343	Seq. ID No. 4344
2075a	Seq. ID No. 4345	Seq. ID No. 4346
2075b	Seq. ID No. 4347	Seq. ID No. 4348
2076b	Seq. ID No. 4351	Seq. ID No. 4352
2076c	Seq. ID No. 4353	Seq. ID No. 4354
2078	Seq. ID No. 4355	Seq. ID No. 4356
2079b	Seq. ID No. 4359	Seq. ID No. 4360
2079c	Seq. ID No. 4361	Seq. ID No. 4362
2081a	Seq. ID No. 4363	Seq. ID No. 4364
2081b	Seq. ID No. 4365	Seq. ID No. 4366

TABLE 20: WYETH ORFS

ORF Number	DNA SEQ ID Number	Protein SEQ ID Number
2086a	Seq. ID No. 4367	Seq. ID No. 4368
2086b	Seq. ID No. 4369	Seq. ID No. 4370
2088	Seq. ID No. 4375	Seq. ID No. 4376
2091	Seq. ID No. 4377	Seq. ID No. 4378
2092	Seq. ID No. 4379	Seq. ID No. 4380
2094	Seq. ID No. 4383	Seq. ID No. 4384
2096c	Seq. ID No. 4389	Seq. ID No. 4390
2096d	Seq. ID No. 4391	Seq. ID No. 4392
2097	Seq. ID No. 4393	Seq. ID No. 4394
2098b	Seq. ID No. 4395	Seq. ID No. 4396
2100	Seq. ID No. 4397	Seq. ID No. 4398
2101	Seq. ID No. 4399	Seq. ID No. 4400
2104	Seq. ID No. 4401	Seq. ID No. 4402
2105	Seq. ID No. 4403	Seq. ID No. 4404
2107a	Seq. ID No. 4405	Seq. ID No. 4406
2107b	Seq. ID No. 4407	Seq. ID No. 4408
2109a	Seq. ID No. 4409	Seq. ID No. 4410
2109b	Seq. ID No. 4411	Seq. ID No. 4412
2110a	Seq. ID No. 4413	Seq. ID No. 4414
2110b	Seq. ID No. 4415	Seq. ID No. 4416
2110c	Seq. ID No. 4417	Seq. ID No. 4418
2112a	Seq. ID No. 4419	Seq. ID No. 4420
2112b	Seq. ID No. 4421	Seq. ID No. 4422
2112c	Seq. ID No. 4423	Seq. ID No. 4424
2114b	Seq. ID No. 4425	Seq. ID No. 4426
2115a	Seq. ID No. 4427	Seq. ID No. 4428
2115b	Seq. ID No. 4429	Seq. ID No. 4430
2115c	Seq. ID No. 4431	Seq. ID No. 4432
2117	Seq. ID No. 4435	Seq. ID No. 4436

TABLE 20: WYETH ORFS

ORF Number	DNA SEQ ID Number	Protein SEQ ID Number
2120a	Seq. ID No. 4437	Seq. ID No. 4438
2120b	Seq. ID No. 4439	Seq. ID No. 4440
2122b	Seq. ID No. 4441	Seq. ID No. 4442
2125a	Seq. ID No. 4449	Seq. ID No. 4450
2125b	Seq. ID No. 4451	Seq. ID No. 4452
2127a	Seq. ID No. 4453	Seq. ID No. 4454
2127b	Seq. ID No. 4455	Seq. ID No. 4456
2128a	Seq. ID No. 4457	Seq. ID No. 4458
2128b	Seq. ID No. 4459	Seq. ID No. 4460
2129a	#N/A	#N/A
2129b	#N/A	#N/A
2133	Seq. ID No. 4461	Seq. ID No. 4462
2138b	Seq. ID No. 4465	Seq. ID No. 4466
2138c	Seq. ID No. 4467	Seq. ID No. 4468
2140b	Seq. ID No. 4471	Seq. ID No. 4472
2142b	Seq. ID No. 4475	Seq. ID No. 4476
2144a	Seq. ID No. 4477	Seq. ID No. 4478
2144b	Seq. ID No. 4479	Seq. ID No. 4480
2146	Seq. ID No. 4481	Seq. ID No. 4482
2147b	Seq. ID No. 4485	Seq. ID No. 4486
2147c	Seq. ID No. 4487	Seq. ID No. 4488
2149a	Seq. ID No. 4489	Seq. ID No. 4490
2149b	Seq. ID No. 4491	Seq. ID No. 4492
2150a	Seq. ID No. 4493	Seq. ID No. 4494
2150b	Seq. ID No. 4495	Seq. ID No. 4496
2150c	Seq. ID No. 4497	Seq. ID No. 4498
2153	Seq. ID No. 4501	Seq. ID No. 4502
2155a	Seq. ID No. 4503	Seq. ID No. 4504
2155b	Seq. ID No. 4505	Seq. ID No. 4506

TABLE 20: WYETH ORFs

ORF Number	DNA SEQ ID Number	Protein SEQ ID Number
2156a	Seq. ID No. 4507	Seq. ID No. 4508
2156b	Seq. ID No. 4509	Seq. ID No. 4510
2156c	Seq. ID No. 4511	Seq. ID No. 4512
2159a	Seq. ID No. 4513	Seq. ID No. 4514
2159b	Seq. ID No. 4515	Seq. ID No. 4516
2160b	Seq. ID No. 4519	Seq. ID No. 4520
2160c	Seq. ID No. 4521	Seq. ID No. 4522
2160d	Seq. ID No. 4523	Seq. ID No. 4524
2161a	Seq. ID No. 4525	Seq. ID No. 4526
2161b	Seq. ID No. 4527	Seq. ID No. 4528
2161c	Seq. ID No. 4529	Seq. ID No. 4530
2164	Seq. ID No. 4531	Seq. ID No. 4532
2165	Seq. ID No. 4533	Seq. ID No. 4534
2166b	Seq. ID No. 4537	Seq. ID No. 4538
2171	Seq. ID No. 4541	Seq. ID No. 4542
2173a	Seq. ID No. 4545	Seq. ID No. 4546
2173b	Seq. ID No. 4547	Seq. ID No. 4548
2174	Seq. ID No. 4549	Seq. ID No. 4550
2175	Seq. ID No. 4551	Seq. ID No. 4552
2176a	Seq. ID No. 4553	Seq. ID No. 4554
2176b	Seq. ID No. 4555	Seq. ID No. 4556
2176d	Seq. ID No. 4559	Seq. ID No. 4560
2177b	Seq. ID No. 4561	Seq. ID No. 4562
2179b	Seq. ID No. 4565	Seq. ID No. 4566
2180	Seq. ID No. 4567	Seq. ID No. 4568
2181b	Seq. ID No. 4571	Seq. ID No. 4572
2182	Seq. ID No. 4573	Seq. ID No. 4574
2183	Seq. ID No. 4575	Seq. ID No. 4576
2185	Seq. ID No. 4577	Seq. ID No. 4578

TABLE 20: WYETH ORFS

ORF Number	DNA SEQ ID Number	Protein SEQ ID Number
2186b	Seq. ID No. 4581	Seq. ID No. 4582
2189b	Seq. ID No. 4585	Seq. ID No. 4586
2190b	Seq. ID No. 4589	Seq. ID No. 4590
2193	Seq. ID No. 4591	Seq. ID No. 4592
2196	Seq. ID No. 4597	Seq. ID No. 4598
2197a	Seq. ID No. 4599	Seq. ID No. 4600
2197b	Seq. ID No. 4601	Seq. ID No. 4602
2197c	Seq. ID No. 4603	Seq. ID No. 4604
2201a	Seq. ID No. 4605	Seq. ID No. 4606
2201b	Seq. ID No. 4607	Seq. ID No. 4608
2203	Seq. ID No. 4609	Seq. ID No. 4610
2204	Seq. ID No. 4611	Seq. ID No. 4612
2206a	Seq. ID No. 4613	Seq. ID No. 4614
2206b	Seq. ID No. 4615	Seq. ID No. 4616
2208a	Seq. ID No. 4617	Seq. ID No. 4618
2208b	Seq. ID No. 4619	Seq. ID No. 4620
2208c	Seq. ID No. 4621	Seq. ID No. 4622
2209	Seq. ID No. 4623	Seq. ID No. 4624
2212b	Seq. ID No. 4627	Seq. ID No. 4628
2215b	Seq. ID No. 4631	Seq. ID No. 4632
2218	Seq. ID No. 4637	Seq. ID No. 4638
2219b	Seq. ID No. 4641	Seq. ID No. 4642
2219c	Seq. ID No. 4643	Seq. ID No. 4644
2220a	Seq. ID No. 4645	Seq. ID No. 4646
2220b	Seq. ID No. 4647	Seq. ID No. 4648
2220c	Seq. ID No. 4649	Seq. ID No. 4650
2222	Seq. ID No. 4653	Seq. ID No. 4654
2225	Seq. ID No. 4659	Seq. ID No. 4660
2226	Seq. ID No. 4661	Seq. ID No. 4662

TABLE 20: WYETH ORFs

ORF Number	DNA SEQ ID Number	Protein SEQ ID Number
2227	Seq. ID No. 4663	Seq. ID No. 4664
2228a	Seq. ID No. 4665	Seq. ID No. 4666
2228b	Seq. ID No. 4667	Seq. ID No. 4668
2228c	Seq. ID No. 4669	Seq. ID No. 4670
2231	Seq. ID No. 4671	Seq. ID No. 4672
2232	Seq. ID No. 4673	Seq. ID No. 4674
2234a	Seq. ID No. 4675	Seq. ID No. 4676
2234b	Seq. ID No. 4677	Seq. ID No. 4678
2234c	Seq. ID No. 4679	Seq. ID No. 4680
2236b	Seq. ID No. 4683	Seq. ID No. 4684
2238	Seq. ID No. 4685	Seq. ID No. 4686
2239b	Seq. ID No. 4687	Seq. ID No. 4688
2240b	Seq. ID No. 4691	Seq. ID No. 4692
2240c	Seq. ID No. 4693	Seq. ID No. 4694
2243a	Seq. ID No. 4695	Seq. ID No. 4696
2245	Seq. ID No. 4699	Seq. ID No. 4700
2246	Seq. ID No. 4701	Seq. ID No. 4702
2248	Seq. ID No. 4703	Seq. ID No. 4704
2249	Seq. ID No. 4705	Seq. ID No. 4706
2253d	Seq. ID No. 4713	Seq. ID No. 4714
2255b	Seq. ID No. 4717	Seq. ID No. 4718
2256	Seq. ID No. 4719	Seq. ID No. 4720
2257	Seq. ID No. 4721	Seq. ID No. 4722
2260b	Seq. ID No. 4727	Seq. ID No. 4728
2260c	Seq. ID No. 4729	Seq. ID No. 4730
2263	Seq. ID No. 4733	Seq. ID No. 4734
2264a	Seq. ID No. 4735	Seq. ID No. 4736
2264b	Seq. ID No. 4737	Seq. ID No. 4738
2267	Seq. ID No. 4739	Seq. ID No. 4740

TABLE 20: WYETH ORFs

ORF Number	DNA SEQ ID Number	Protein SEQ ID Number
2268	Seq. ID No. 4741	Seq. ID No. 4742
2269	Seq. ID No. 4743	Seq. ID No. 4744
2272	Seq. ID No. 4747	Seq. ID No. 4748
2273	Seq. ID No. 4749	Seq. ID No. 4750
2274	Seq. ID No. 4751	Seq. ID No. 4752
2275b	Seq. ID No. 4755	Seq. ID No. 4756
2275c	Seq. ID No. 4757	Seq. ID No. 4758
2276c	Seq. ID No. 4763	Seq. ID No. 4764
2276d	Seq. ID No. 4765	Seq. ID No. 4766
2277a	Seq. ID No. 4767	Seq. ID No. 4768
2277b	Seq. ID No. 4769	Seq. ID No. 4770
2278b	Seq. ID No. 4773	Seq. ID No. 4774
2278c	Seq. ID No. 4775	Seq. ID No. 4776
2278d	Seq. ID No. 4777	Seq. ID No. 4778
2280	Seq. ID No. 4779	Seq. ID No. 4780
2284	Seq. ID No. 4781	Seq. ID No. 4782
2286b	Seq. ID No. 4787	Seq. ID No. 4788
2288	Seq. ID No. 4789	Seq. ID No. 4790
2290	Seq. ID No. 4791	Seq. ID No. 4792
2291a	Seq. ID No. 4793	Seq. ID No. 4794
2291b	Seq. ID No. 4795	Seq. ID No. 4796
2291c	Seq. ID No. 4797	Seq. ID No. 4798
2292b	Seq. ID No. 4801	Seq. ID No. 4802
2292c	Seq. ID No. 4803	Seq. ID No. 4804
2294	Seq. ID No. 4805	Seq. ID No. 4806
2298	Seq. ID No. 4809	Seq. ID No. 4810
2299	Seq. ID No. 4811	Seq. ID No. 4812
2300	Seq. ID No. 4813	Seq. ID No. 4814
2301	Seq. ID No. 4815	Seq. ID No. 4816

TABLE 20: WYETH ORFs

ORF Number	DNA SEQ ID Number	Protein SEQ ID Number
2302	Seq. ID No. 4817	Seq. ID No. 4818
2303	Seq. ID No. 4819	Seq. ID No. 4820
2307	Seq. ID No. 4825	Seq. ID No. 4826
2308	Seq. ID No. 4827	Seq. ID No. 4828
2309a	Seq. ID No. 4829	Seq. ID No. 4830
2309b	Seq. ID No. 4831	Seq. ID No. 4832
2309c	Seq. ID No. 4833	Seq. ID No. 4834
2311	Seq. ID No. 4837	Seq. ID No. 4838
2312a	Seq. ID No. 4839	Seq. ID No. 4840
2312b	Seq. ID No. 4841	Seq. ID No. 4842
2312c	Seq. ID No. 4843	Seq. ID No. 4844
2314	Seq. ID No. 4845	Seq. ID No. 4846
2316	Seq. ID No. 4849	Seq. ID No. 4850
2317	Seq. ID No. 4851	Seq. ID No. 4852
2320	Seq. ID No. 4853	Seq. ID No. 4854
2321a	Seq. ID No. 4855	Seq. ID No. 4856
2322	Seq. ID No. 4861	Seq. ID No. 4862
2324	Seq. ID No. 4863	Seq. ID No. 4864
2328	Seq. ID No. 4867	Seq. ID No. 4868
2329d	Seq. ID No. 4875	Seq. ID No. 4876
2330	Seq. ID No. 4877	Seq. ID No. 4878
2331	Seq. ID No. 4879	Seq. ID No. 4880
2333	Seq. ID No. 4881	Seq. ID No. 4882
2335	Seq. ID No. 4883	Seq. ID No. 4884
2338a	Seq. ID No. 4889	Seq. ID No. 4890
2338b	Seq. ID No. 4891	Seq. ID No. 4892
2338c	Seq. ID No. 4893	Seq. ID No. 4894
2342a	Seq. ID No. 4895	Seq. ID No. 4896
2342b	Seq. ID No. 4897	Seq. ID No. 4898

TABLE 20: WYETH ORFs

ORF Number	DNA SEQ ID Number	Protein SEQ ID Number
2342c	Seq. ID No. 4899	Seq. ID No. 4900
2344	Seq. ID No. 4901	Seq. ID No. 4902
2345	Seq. ID No. 4903	Seq. ID No. 4904
2347	Seq. ID No. 4905	Seq. ID No. 4906
2348	Seq. ID No. 4907	Seq. ID No. 4908
2349a	Seq. ID No. 4909	Seq. ID No. 4910
2349b	Seq. ID No. 4911	Seq. ID No. 4912
2350a	Seq. ID No. 4913	Seq. ID No. 4914
2353	Seq. ID No. 4915	Seq. ID No. 4916
2354	Seq. ID No. 4917	Seq. ID No. 4918
2357	Seq. ID No. 4919	Seq. ID No. 4920
2358	Seq. ID No. 4921	Seq. ID No. 4922
2360	Seq. ID No. 4923	Seq. ID No. 4924
2361b	Seq. ID No. 4927	Seq. ID No. 4928
2363b	Seq. ID No. 4931	Seq. ID No. 4932
2365b	Seq. ID No. 4935	Seq. ID No. 4936
2366a	Seq. ID No. 4937	Seq. ID No. 4938
2366b	Seq. ID No. 4939	Seq. ID No. 4940
2367	Seq. ID No. 4941	Seq. ID No. 4942
2368	Seq. ID No. 4943	Seq. ID No. 4944
2369	Seq. ID No. 4945	Seq. ID No. 4946
2370	Seq. ID No. 4947	Seq. ID No. 4948
2371a	Seq. ID No. 4949	Seq. ID No. 4950
2372	Seq. ID No. 4951	Seq. ID No. 4952
2373	Seq. ID No. 4953	Seq. ID No. 4954
2374b	Seq. ID No. 4957	Seq. ID No. 4958
2376	Seq. ID No. 4959	Seq. ID No. 4960
2377a	Seq. ID No. 4961	Seq. ID No. 4962
2377b	Seq. ID No. 4963	Seq. ID No. 4964

TABLE 20: WYETH ORFs

ORF Number	DNA SEQ ID Number	Protein SEQ ID Number
2381	Seq. ID No. 4973	Seq. ID No. 4974
2382c	Seq. ID No. 4975	Seq. ID No. 4976
2384a	Seq. ID No. 4977	Seq. ID No. 4978
2384b	Seq. ID No. 4979	Seq. ID No. 4980
2386b	Seq. ID No. 4981	Seq. ID No. 4982
2386c	Seq. ID No. 4983	Seq. ID No. 4984
2387	Seq. ID No. 4985	Seq. ID No. 4986
2390	Seq. ID No. 4987	Seq. ID No. 4988
2391	Seq. ID No. 4989	Seq. ID No. 4990
2392	Seq. ID No. 4991	Seq. ID No. 4992
2394	Seq. ID No. 4993	Seq. ID No. 4994
2395	Seq. ID No. 4995	Seq. ID No. 4996
2396	Seq. ID No. 4997	Seq. ID No. 4998
2397	Seq. ID No. 4999	Seq. ID No. 5000
2399a	Seq. ID No. 5003	Seq. ID No. 5004
2399b	Seq. ID No. 5005	Seq. ID No. 5006
2399c	Seq. ID No. 5007	Seq. ID No. 5008
2401	Seq. ID No. 5009	Seq. ID No. 5010
2402a	Seq. ID No. 5011	Seq. ID No. 5012
2402b	Seq. ID No. 5013	Seq. ID No. 5014
2403b	Seq. ID No. 5017	Seq. ID No. 5018
2404a	Seq. ID No. 5019	Seq. ID No. 5020
2404b	Seq. ID No. 5021	Seq. ID No. 5022
2407a	Seq. ID No. 5023	Seq. ID No. 5024
2409a	Seq. ID No. 5025	Seq. ID No. 5026
2410	Seq. ID No. 5029	Seq. ID No. 5030
2412	Seq. ID No. 5031	Seq. ID No. 5032
2413a	Seq. ID No. 5033	Seq. ID No. 5034
2413b	Seq. ID No. 5035	Seq. ID No. 5036

TABLE 20: WYETH ORFs

ORF Number	DNA SEQ ID Number	Protein SEQ ID Number
2416b	Seq. ID No. 5041	Seq. ID No. 5042
2416c	Seq. ID No. 5043	Seq. ID No. 5044
2417a	Seq. ID No. 5045	Seq. ID No. 5046
2417b	Seq. ID No. 5047	Seq. ID No. 5048
2422b	Seq. ID No. 5057	Seq. ID No. 5058
2422c	Seq. ID No. 5059	Seq. ID No. 5060
2423b	Seq. ID No. 5063	Seq. ID No. 5064
2424a	Seq. ID No. 5065	Seq. ID No. 5066
2424b	Seq. ID No. 5067	Seq. ID No. 5068
2424c	Seq. ID No. 5069	Seq. ID No. 5070
2428b	Seq. ID No. 5075	Seq. ID No. 5076
2428c	Seq. ID No. 5077	Seq. ID No. 5078
2429	Seq. ID No. 5079	Seq. ID No. 5080
2432	Seq. ID No. 5081	Seq. ID No. 5082
2433	Seq. ID No. 5083	Seq. ID No. 5084
2434	Seq. ID No. 5085	Seq. ID No. 5086
2440	Seq. ID No. 5087	Seq. ID No. 5088
2442b	Seq. ID No. 5091	Seq. ID No. 5092
2444c	Seq. ID No. 5099	Seq. ID No. 5100
2444d	Seq. ID No. 5101	Seq. ID No. 5102
2445	Seq. ID No. 5103	Seq. ID No. 5104
2449b	Seq. ID No. 5109	Seq. ID No. 5110
2451	Seq. ID No. 5111	Seq. ID No. 5112
2452	Seq. ID No. 5113	Seq. ID No. 5114
2453	Seq. ID No. 5115	Seq. ID No. 5116
2455	Seq. ID No. 5117	Seq. ID No. 5118
2456b	Seq. ID No. 5121	Seq. ID No. 5122
2456d	Seq. ID No. 5125	Seq. ID No. 5126
2456e	Seq. ID No. 5127	Seq. ID No. 5128

TABLE 20: WYETH ORFS

ORF Number	DNA SEQ ID Number	Protein SEQ ID Number
2458c	Seq. ID No. 5133	Seq. ID No. 5134
2458f	Seq. ID No. 5139	Seq. ID No. 5140
2458g	Seq. ID No. 5141	Seq. ID No. 5142
2461b	Seq. ID No. 5145	Seq. ID No. 5146
2462a	Seq. ID No. 5147	Seq. ID No. 5148
2462b	Seq. ID No. 5149	Seq. ID No. 5150
2463a	Seq. ID No. 5151	Seq. ID No. 5152
2465a	Seq. ID No. 5155	Seq. ID No. 5156
2465b	Seq. ID No. 5157	Seq. ID No. 5158
2468a	Seq. ID No. 5159	Seq. ID No. 5160
2468b	Seq. ID No. 5161	Seq. ID No. 5162
2469b	Seq. ID No. 5165	Seq. ID No. 5166
2470	Seq. ID No. 5167	Seq. ID No. 5168
2471	Seq. ID No. 5169	Seq. ID No. 5170
2474c	Seq. ID No. 5177	Seq. ID No. 5178
2475b	Seq. ID No. 5181	Seq. ID No. 5182
2475c	Seq. ID No. 5183	Seq. ID No. 5184
2477	Seq. ID No. 5185	Seq. ID No. 5186
2480	Seq. ID No. 5187	Seq. ID No. 5188
2481a	Seq. ID No. 5189	Seq. ID No. 5190
2481b	Seq. ID No. 5191	Seq. ID No. 5192
2482	Seq. ID No. 5193	Seq. ID No. 5194
2483	Seq. ID No. 5195	Seq. ID No. 5196
2484a	Seq. ID No. 5197	Seq. ID No. 5198
2484b	Seq. ID No. 5199	Seq. ID No. 5200
2485	Seq. ID No. 5201	Seq. ID No. 5202
2489	Seq. ID No. 5203	Seq. ID No. 5204
2490	Seq. ID No. 5205	Seq. ID No. 5206
2492b	Seq. ID No. 5209	Seq. ID No. 5210

TABLE 20: WYETH ORFs

ORF Number	DNA SEQ ID Number	Protein SEQ ID Number
2494	Seq. ID No. 5211	Seq. ID No. 5212
2495b	Seq. ID No. 5215	Seq. ID No. 5216
2497b	Seq. ID No. 5219	Seq. ID No. 5220
2498b	Seq. ID No. 5221	Seq. ID No. 5222
2501a	Seq. ID No. 5229	Seq. ID No. 5230
2501b	Seq. ID No. 5231	Seq. ID No. 5232
2506	Seq. ID No. 5239	Seq. ID No. 5240
2507b	Seq. ID No. 5241	Seq. ID No. 5242
2507c	Seq. ID No. 5243	Seq. ID No. 5244
2510	Seq. ID No. 5245	Seq. ID No. 5246
2513b	Seq. ID No. 5251	Seq. ID No. 5252
2513c	Seq. ID No. 5253	Seq. ID No. 5254
2514	Seq. ID No. 5255	Seq. ID No. 5256
2516b	Seq. ID No. 5261	Seq. ID No. 5262
2517a	Seq. ID No. 5263	Seq. ID No. 5264
2517b	Seq. ID No. 5265	Seq. ID No. 5266
2518a	Seq. ID No. 5267	Seq. ID No. 5268
2520c	Seq. ID No. 5277	Seq. ID No. 5278
2520d	Seq. ID No. 5279	Seq. ID No. 5280
2521	Seq. ID No. 5281	Seq. ID No. 5282
2525a	Seq. ID No. 5285	Seq. ID No. 5286
2525b	Seq. ID No. 5287	Seq. ID No. 5288
2527b	Seq. ID No. 5291	Seq. ID No. 5292
2528b	Seq. ID No. 5295	Seq. ID No. 5296
2528c	Seq. ID No. 5297	Seq. ID No. 5298
2528d	Seq. ID No. 5299	Seq. ID No. 5300
2532b	Seq. ID No. 5301	Seq. ID No. 5302
2532c	Seq. ID No. 5303	Seq. ID No. 5304
2534	Seq. ID No. 5305	Seq. ID No. 5306

TABLE 20: WYETH ORFs

ORF Number	DNA SEQ ID Number	Protein SEQ ID Number
2535a	Seq. ID No. 5307	Seq. ID No. 5308
2535b	Seq. ID No. 5309	Seq. ID No. 5310
2538	Seq. ID No. 5311	Seq. ID No. 5312
2541	Seq. ID No. 5313	Seq. ID No. 5314
2542b	Seq. ID No. 5317	Seq. ID No. 5318
2542c	Seq. ID No. 5319	Seq. ID No. 5320
2543	Seq. ID No. 5321	Seq. ID No. 5322
2544	Seq. ID No. 5323	Seq. ID No. 5324
2546	Seq. ID No. 5327	Seq. ID No. 5328
2547b	Seq. ID No. 5329	Seq. ID No. 5330
2547c	Seq. ID No. 5331	Seq. ID No. 5332
2548a	Seq. ID No. 5333	Seq. ID No. 5334
2548b	Seq. ID No. 5335	Seq. ID No. 5336
2549	Seq. ID No. 5337	Seq. ID No. 5338
2550e	Seq. ID No. 5343	Seq. ID No. 5344
2552	Seq. ID No. 5345	Seq. ID No. 5346
2554a	Seq. ID No. 5349	Seq. ID No. 5350
2554b	Seq. ID No. 5351	Seq. ID No. 5352
2555c	Seq. ID No. 5357	Seq. ID No. 5358
2555d	Seq. ID No. 5359	Seq. ID No. 5360
2559	Seq. ID No. 5365	Seq. ID No. 5366
2561	Seq. ID No. 5367	Seq. ID No. 5368
2563	Seq. ID No. 5373	Seq. ID No. 5374
2564b	Seq. ID No. 5377	Seq. ID No. 5378
2564c	Seq. ID No. 5379	Seq. ID No. 5380
2564d	Seq. ID No. 5381	Seq. ID No. 5382
2566	Seq. ID No. 5383	Seq. ID No. 5384
2567b	Seq. ID No. 5387	Seq. ID No. 5388
2568	Seq. ID No. 5389	Seq. ID No. 5390

TABLE 20: WYETH ORFs

ORF Number	DNA SEQ ID Number	Protein SEQ ID Number
2572	Seq. ID No. 5391	Seq. ID No. 5392
2573	Seq. ID No. 5393	Seq. ID No. 5394
2576	Seq. ID No. 5397	Seq. ID No. 5398
2578	Seq. ID No. 5399	Seq. ID No. 5400
2579b	Seq. ID No. 5401	Seq. ID No. 5402
2581	Seq. ID No. 5403	Seq. ID No. 5404
2582a	Seq. ID No. 5405	Seq. ID No. 5406
2582b	Seq. ID No. 5407	Seq. ID No. 5408
2582c	Seq. ID No. 5409	Seq. ID No. 5410
2585	Seq. ID No. 5411	Seq. ID No. 5412
2587b	Seq. ID No. 5415	Seq. ID No. 5416
2588	Seq. ID No. 5417	Seq. ID No. 5418
2589	Seq. ID No. 5419	Seq. ID No. 5420
2591	Seq. ID No. 5421	Seq. ID No. 5422
2592	Seq. ID No. 5423	Seq. ID No. 5424
2593a	Seq. ID No. 5425	Seq. ID No. 5426
2593b	Seq. ID No. 5427	Seq. ID No. 5428
2594b	Seq. ID No. 5431	Seq. ID No. 5432
2596	Seq. ID No. 5433	Seq. ID No. 5434
2597a	Seq. ID No. 5435	Seq. ID No. 5436
2597b	Seq. ID No. 5437	Seq. ID No. 5438
2597c	Seq. ID No. 5439	Seq. ID No. 5440
2598	Seq. ID No. 5441	Seq. ID No. 5442
2602	Seq. ID No. 5443	Seq. ID No. 5444
2605b	Seq. ID No. 5447	Seq. ID No. 5448
2606	Seq. ID No. 5449	Seq. ID No. 5450
2608	Seq. ID No. 5451	Seq. ID No. 5452
2610	Seq. ID No. 5453	Seq. ID No. 5454
2611	Seq. ID No. 5455	Seq. ID No. 5456

TABLE 20: WYETH ORFS

ORF Number	DNA SEQ ID Number	Protein SEQ ID Number
2613	Seq. ID No. 5457	Seq. ID No. 5458
2616e	Seq. ID No. 5467	Seq. ID No. 5468
2616g	Seq. ID No. 5471	Seq. ID No. 5472
2616h	Seq. ID No. 5473	Seq. ID No. 5474
2617b	Seq. ID No. 5477	Seq. ID No. 5478
2618a	Seq. ID No. 5479	Seq. ID No. 5480
2618b	Seq. ID No. 5481	Seq. ID No. 5482
2623b	Seq. ID No. 5491	Seq. ID No. 5492
2624a	Seq. ID No. 5493	Seq. ID No. 5494
2624b	Seq. ID No. 5495	Seq. ID No. 5496
2625b	Seq. ID No. 5499	Seq. ID No. 5500
2626b	Seq. ID No. 5503	Seq. ID No. 5504
2628	Seq. ID No. 5509	Seq. ID No. 5510
2629b	Seq. ID No. 5513	Seq. ID No. 5514
2631	Seq. ID No. 5515	Seq. ID No. 5516
2632	Seq. ID No. 5517	Seq. ID No. 5518
2633a	Seq. ID No. 5519	Seq. ID No. 5520
2633b	Seq. ID No. 5521	Seq. ID No. 5522
2633e	Seq. ID No. 5527	Seq. ID No. 5528
2637a	Seq. ID No. 5529	Seq. ID No. 5530
2637b	Seq. ID No. 5531	Seq. ID No. 5532
2642	Seq. ID No. 5533	Seq. ID No. 5534
2643b	Seq. ID No. 5537	Seq. ID No. 5538
2645	Seq. ID No. 5539	Seq. ID No. 5540
2647	Seq. ID No. 5541	Seq. ID No. 5542
2648a	Seq. ID No. 5543	Seq. ID No. 5544
2648b	Seq. ID No. 5545	Seq. ID No. 5546
2649	Seq. ID No. 5547	Seq. ID No. 5548
2650	Seq. ID No. 5549	Seq. ID No. 5550

TABLE 20: WYETH ORFs

ORF Number	DNA SEQ ID Number	Protein SEQ ID Number
2652a	Seq. ID No. 5551	Seq. ID No. 5552
2652b	Seq. ID No. 5553	Seq. ID No. 5554
2655b	Seq. ID No. 5557	Seq. ID No. 5558
2656	Seq. ID No. 5559	Seq. ID No. 5560
2658b	Seq. ID No. 5563	Seq. ID No. 5564
2659b	Seq. ID No. 5567	Seq. ID No. 5568
2660	Seq. ID No. 5569	Seq. ID No. 5570
2664b	Seq. ID No. 5575	Seq. ID No. 5576
2665	Seq. ID No. 5577	Seq. ID No. 5578
2666b	Seq. ID No. 5581	Seq. ID No. 5582
2667a	Seq. ID No. 5583	Seq. ID No. 5584
2667b	Seq. ID No. 5585	Seq. ID No. 5586
2669b	Seq. ID No. 5589	Seq. ID No. 5590
2669c	Seq. ID No. 5591	Seq. ID No. 5592
2672	Seq. ID No. 5593	Seq. ID No. 5594
2673	Seq. ID No. 5595	Seq. ID No. 5596
2674b	Seq. ID No. 5599	Seq. ID No. 5600
2676	Seq. ID No. 5601	Seq. ID No. 5602
2677c	Seq. ID No. 5607	Seq. ID No. 5608
2679c	Seq. ID No. 5613	Seq. ID No. 5614
2679d	Seq. ID No. 5615	Seq. ID No. 5616
2680a	Seq. ID No. 5617	Seq. ID No. 5618
2680b	Seq. ID No. 5619	Seq. ID No. 5620
2680c	Seq. ID No. 5621	Seq. ID No. 5622
2683b	Seq. ID No. 5625	Seq. ID No. 5626
2684a	Seq. ID No. 5627	Seq. ID No. 5628
2684b	Seq. ID No. 5629	Seq. ID No. 5630
2686	Seq. ID No. 5631	Seq. ID No. 5632
2688c	Seq. ID No. 5637	Seq. ID No. 5638

TABLE 20: WYETH ORFs

ORF Number	DNA SEQ ID Number	Protein SEQ ID Number
2689a	Seq. ID No. 5639	Seq. ID No. 5640
2689b	Seq. ID No. 5641	Seq. ID No. 5642
2690b	Seq. ID No. 5645	Seq. ID No. 5646
2690c	Seq. ID No. 5647	Seq. ID No. 5648
2692b	Seq. ID No. 5649	Seq. ID No. 5650
2693	Seq. ID No. 5651	Seq. ID No. 5652
2694b	Seq. ID No. 5655	Seq. ID No. 5656
2695	Seq. ID No. 5657	Seq. ID No. 5658
2696b	Seq. ID No. 5661	Seq. ID No. 5662
2709	Seq. ID No. 5665	Seq. ID No. 5666
2710c	Seq. ID No. 5667	Seq. ID No. 5668
2712	Seq. ID No. 5669	Seq. ID No. 5670
2716b	Seq. ID No. 5677	Seq. ID No. 5678
2716c	Seq. ID No. 5679	Seq. ID No. 5680
2718b	Seq. ID No. 5683	Seq. ID No. 5684
2718c	Seq. ID No. 5685	Seq. ID No. 5686
2719a	Seq. ID No. 5687	Seq. ID No. 5688
2719b	Seq. ID No. 5689	Seq. ID No. 5690
2721a	Seq. ID No. 5691	Seq. ID No. 5692
2721b	Seq. ID No. 5693	Seq. ID No. 5694
2722b	Seq. ID No. 5697	Seq. ID No. 5698
2723	Seq. ID No. 5699	Seq. ID No. 5700
2724	Seq. ID No. 5701	Seq. ID No. 5702
2725a	Seq. ID No. 5703	Seq. ID No. 5704
2725b	Seq. ID No. 5705	Seq. ID No. 5706
2726	Seq. ID No. 5707	Seq. ID No. 5708
2728b	Seq. ID No. 5711	Seq. ID No. 5712
2731a	Seq. ID No. 5713	Seq. ID No. 5714
2731b	Seq. ID No. 5715	Seq. ID No. 5716

TABLE 20: WYETH ORFs

ORF Number	DNA SEQ ID Number	Protein SEQ ID Number
2732	Seq. ID No. 5717	Seq. ID No. 5718
2734a	Seq. ID No. 5719	Seq. ID No. 5720
2734b	Seq. ID No. 5721	Seq. ID No. 5722
2734c	Seq. ID No. 5723	Seq. ID No. 5724
2735a	Seq. ID No. 5725	Seq. ID No. 5726
2735b	Seq. ID No. 5727	Seq. ID No. 5728
2738d	Seq. ID No. 5735	Seq. ID No. 5736
2742b	Seq. ID No. 5739	Seq. ID No. 5740
2743a	Seq. ID No. 5741	Seq. ID No. 5742
2743b	Seq. ID No. 5743	Seq. ID No. 5744
2744	Seq. ID No. 5745	Seq. ID No. 5746
2745a	Seq. ID No. 5747	Seq. ID No. 5748
2745b	Seq. ID No. 5749	Seq. ID No. 5750
2746	Seq. ID No. 5751	Seq. ID No. 5752
2747a	Seq. ID No. 5753	Seq. ID No. 5754
2747b	Seq. ID No. 5755	Seq. ID No. 5756
2748a	Seq. ID No. 5757	Seq. ID No. 5758
2748b	Seq. ID No. 5759	Seq. ID No. 5760
2748c	Seq. ID No. 5761	Seq. ID No. 5762
2749d	Seq. ID No. 5769	Seq. ID No. 5770
2749e	Seq. ID No. 5771	Seq. ID No. 5772
2752	Seq. ID No. 5777	Seq. ID No. 5778
2753	Seq. ID No. 5779	Seq. ID No. 5780
2757b	Seq. ID No. 5783	Seq. ID No. 5784
2758b	Seq. ID No. 5787	Seq. ID No. 5788
2758d	Seq. ID No. 5791	Seq. ID No. 5792
2759b	Seq. ID No. 5795	Seq. ID No. 5796
2760b	Seq. ID No. 5799	Seq. ID No. 5800
2760c	Seq. ID No. 5801	Seq. ID No. 5802

TABLE 20: WYETH ORFs

ORF Number	DNA SEQ ID Number	Protein SEQ ID Number
2763b	Seq. ID No. 5807	Seq. ID No. 5808
2763c	Seq. ID No. 5809	Seq. ID No. 5810
2765b	Seq. ID No. 5813	Seq. ID No. 5814
2765c	Seq. ID No. 5815	Seq. ID No. 5816
2766b	Seq. ID No. 5819	Seq. ID No. 5820
2768a	Seq. ID No. 5821	Seq. ID No. 5822
2768b	Seq. ID No. 5823	Seq. ID No. 5824
2768c	Seq. ID No. 5825	Seq. ID No. 5826
2769a	Seq. ID No. 5827	Seq. ID No. 5828
2770	Seq. ID No. 5829	Seq. ID No. 5830
2771a	Seq. ID No. 5831	Seq. ID No. 5832
2771b	Seq. ID No. 5833	Seq. ID No. 5834
2773	Seq. ID No. 5835	Seq. ID No. 5836
2774a	Seq. ID No. 5837	Seq. ID No. 5838
2774b	Seq. ID No. 5839	Seq. ID No. 5840
2774c	Seq. ID No. 5841	Seq. ID No. 5842
2776b	Seq. ID No. 5845	Seq. ID No. 5846
2777	Seq. ID No. 5847	Seq. ID No. 5848
2778	Seq. ID No. 5849	Seq. ID No. 5850
2779	Seq. ID No. 5851	Seq. ID No. 5852
2784	Seq. ID No. 5855	Seq. ID No. 5856
2785a	Seq. ID No. 5857	Seq. ID No. 5858
2785b	Seq. ID No. 5859	Seq. ID No. 5860
2786a	Seq. ID No. 5861	Seq. ID No. 5862
2786b	Seq. ID No. 5863	Seq. ID No. 5864
2786c	Seq. ID No. 5865	Seq. ID No. 5866
2787b	Seq. ID No. 5869	Seq. ID No. 5870
2787c	Seq. ID No. 5871	Seq. ID No. 5872
2788b	Seq. ID No. 5873	Seq. ID No. 5874

TABLE 20: WYETH ORFS

ORF Number	DNA SEQ ID Number	Protein SEQ ID Number
2789	Seq. ID No. 5875	Seq. ID No. 5876
2791	Seq. ID No. 5879	Seq. ID No. 5880
2793	Seq. ID No. 5881	Seq. ID No. 5882
2794	Seq. ID No. 5883	Seq. ID No. 5884
2799a	Seq. ID No. 5889	Seq. ID No. 5890
2801b	Seq. ID No. 5895	Seq. ID No. 5896
2804	Seq. ID No. 5897	Seq. ID No. 5898
2805b	Seq. ID No. 5901	Seq. ID No. 5902
2809	Seq. ID No. 5903	Seq. ID No. 5904
2810d	Seq. ID No. 5911	Seq. ID No. 5912
2812	Seq. ID No. 5913	Seq. ID No. 5914
2814	Seq. ID No. 5915	Seq. ID No. 5916
2815	Seq. ID No. 5917	Seq. ID No. 5918
2816	Seq. ID No. 5919	Seq. ID No. 5920
2818d	Seq. ID No. 5927	Seq. ID No. 5928
2818e	Seq. ID No. 5929	Seq. ID No. 5930
2820	Seq. ID No. 5933	Seq. ID No. 5934
2821a	Seq. ID No. 5935	Seq. ID No. 5936
2821b	Seq. ID No. 5937	Seq. ID No. 5938
2822b	Seq. ID No. 5941	Seq. ID No. 5942
2824a	Seq. ID No. 5945	Seq. ID No. 5946
2824b	Seq. ID No. 5947	Seq. ID No. 5948
2829b	Seq. ID No. 5951	Seq. ID No. 5952
2834a	Seq. ID No. 5959	Seq. ID No. 5960
2834b	Seq. ID No. 5961	Seq. ID No. 5962
2837a	Seq. ID No. 5963	Seq. ID No. 5964
2837b	Seq. ID No. 5965	Seq. ID No. 5966
2842a	Seq. ID No. 5967	Seq. ID No. 5968
2842b	Seq. ID No. 5969	Seq. ID No. 5970

TABLE 20: WYETH ORFs

ORF Number	DNA SEQ ID Number	Protein SEQ ID Number
2843a	Seq. ID No. 5971	Seq. ID No. 5972
2843b	Seq. ID No. 5973	Seq. ID No. 5974
2846a	Seq. ID No. 5977	Seq. ID No. 5978
2846b	Seq. ID No. 5979	Seq. ID No. 5980
2848	Seq. ID No. 5981	Seq. ID No. 5982
2851	Seq. ID No. 5985	Seq. ID No. 5986
2852	Seq. ID No. 5987	Seq. ID No. 5988
2853	Seq. ID No. 5989	Seq. ID No. 5990
2854a	Seq. ID No. 5991	Seq. ID No. 5992
2854b	Seq. ID No. 5993	Seq. ID No. 5994
2855	Seq. ID No. 5995	Seq. ID No. 5996
2856b	Seq. ID No. 5999	Seq. ID No. 6000
2856c	Seq. ID No. 6001	Seq. ID No. 6002
2857	Seq. ID No. 6003	Seq. ID No. 6004
2860b	Seq. ID No. 6009	Seq. ID No. 6010
2860c	Seq. ID No. 6011	Seq. ID No. 6012
2862	Seq. ID No. 6013	Seq. ID No. 6014
2863	Seq. ID No. 6015	Seq. ID No. 6016
2864	Seq. ID No. 6017	Seq. ID No. 6018
2869b	Seq. ID No. 6025	Seq. ID No. 6026
2869c	Seq. ID No. 6027	Seq. ID No. 6028
2871	Seq. ID No. 6029	Seq. ID No. 6030
2872	Seq. ID No. 6031	Seq. ID No. 6032
2875	Seq. ID No. 6033	Seq. ID No. 6034
2877	Seq. ID No. 6035	Seq. ID No. 6036
2879b	Seq. ID No. 6039	Seq. ID No. 6040
2879c	Seq. ID No. 6041	Seq. ID No. 6042
2881	Seq. ID No. 6043	Seq. ID No. 6044
2882	Seq. ID No. 6045	Seq. ID No. 6046

TABLE 20: WYETH ORFs

ORF Number	DNA SEQ ID Number	Protein SEQ ID Number
2883b	Seq. ID No. 6049	Seq. ID No. 6050
2883c	Seq. ID No. 6051	Seq. ID No. 6052
2883d	Seq. ID No. 6053	Seq. ID No. 6054
2886a	Seq. ID No. 6055	Seq. ID No. 6056
2886b	Seq. ID No. 6057	Seq. ID No. 6058
2887b	Seq. ID No. 6061	Seq. ID No. 6062
2888	Seq. ID No. 6063	Seq. ID No. 6064
2890	Seq. ID No. 6065	Seq. ID No. 6066
2891b	Seq. ID No. 6069	Seq. ID No. 6070
2891c	Seq. ID No. 6071	Seq. ID No. 6072
2893b	Seq. ID No. 6073	Seq. ID No. 6074
2894b	Seq. ID No. 6077	Seq. ID No. 6078
2894c	Seq. ID No. 6079	Seq. ID No. 6080
2897b	Seq. ID No. 6085	Seq. ID No. 6086
2900a	Seq. ID No. 6087	Seq. ID No. 6088
2900b	Seq. ID No. 6089	Seq. ID No. 6090
2901b	Seq. ID No. 6093	Seq. ID No. 6094
2902	Seq. ID No. 6095	Seq. ID No. 6096
2905b	Seq. ID No. 6101	Seq. ID No. 6102
2906	Seq. ID No. 6103	Seq. ID No. 6104
2909c	Seq. ID No. 6109	Seq. ID No. 6110
2909d	Seq. ID No. 6111	Seq. ID No. 6112
2913b	Seq. ID No. 6117	Seq. ID No. 6118
2915b	Seq. ID No. 6121	Seq. ID No. 6122
2915c	Seq. ID No. 6123	Seq. ID No. 6124
2918	Seq. ID No. 6129	Seq. ID No. 6130
2920	Seq. ID No. 6131	Seq. ID No. 6132
2921	Seq. ID No. 6133	Seq. ID No. 6134
2922b	Seq. ID No. 6135	Seq. ID No. 6136

TABLE 20: WYETH ORFs

ORF Number	DNA SEQ ID Number	Protein SEQ ID Number
2923a	Seq. ID No. 6137	Seq. ID No. 6138
2923b	Seq. ID No. 6139	Seq. ID No. 6140
2923c	Seq. ID No. 6141	Seq. ID No. 6142
2925b	Seq. ID No. 6145	Seq. ID No. 6146
2926c	Seq. ID No. 6151	Seq. ID No. 6152
2928b	Seq. ID No. 6155	Seq. ID No. 6156
2928c	Seq. ID No. 6157	Seq. ID No. 6158
2929b	Seq. ID No. 6159	Seq. ID No. 6160
2931c	Seq. ID No. 6165	Seq. ID No. 6166
2933a	Seq. ID No. 6167	Seq. ID No. 6168
2933b	Seq. ID No. 6169	Seq. ID No. 6170
2934	Seq. ID No. 6171	Seq. ID No. 6172
2935b	Seq. ID No. 6175	Seq. ID No. 6176
2936	Seq. ID No. 6177	Seq. ID No. 6178
2939b	Seq. ID No. 6181	Seq. ID No. 6182
2941c	Seq. ID No. 6187	Seq. ID No. 6188
2943c	Seq. ID No. 6193	Seq. ID No. 6194
2943d	Seq. ID No. 6195	Seq. ID No. 6196
2944b	Seq. ID No. 6197	Seq. ID No. 6198
2945b	Seq. ID No. 6199	Seq. ID No. 6200
2947	Seq. ID No. 6201	Seq. ID No. 6202
2948d	Seq. ID No. 6209	Seq. ID No. 6210
2950b	Seq. ID No. 6213	Seq. ID No. 6214
2951	Seq. ID No. 6215	Seq. ID No. 6216
2952	Seq. ID No. 6217	Seq. ID No. 6218
2954	Seq. ID No. 6219	Seq. ID No. 6220
2955f	Seq. ID No. 6231	Seq. ID No. 6232
2955g	Seq. ID No. 6233	Seq. ID No. 6234
2957	Seq. ID No. 6235	Seq. ID No. 6236

TABLE 20: WYETH ORFs

ORF Number	DNA SEQ ID Number	Protein SEQ ID Number
2958b	Seq. ID No. 6239	Seq. ID No. 6240
2958c	Seq. ID No. 6241	Seq. ID No. 6242
2959	Seq. ID No. 6243	Seq. ID No. 6244
2962b	Seq. ID No. 6249	Seq. ID No. 6250
2965c	Seq. ID No. 6257	Seq. ID No. 6258
2966	Seq. ID No. 6259	Seq. ID No. 6260
2967	Seq. ID No. 6261	Seq. ID No. 6262
2969	Seq. ID No. 6263	Seq. ID No. 6264
2970b	Seq. ID No. 6267	Seq. ID No. 6268
2971a	Seq. ID No. 6269	Seq. ID No. 6270
2971b	Seq. ID No. 6271	Seq. ID No. 6272
2974b	Seq. ID No. 6275	Seq. ID No. 6276
2975	Seq. ID No. 6277	Seq. ID No. 6278
2977a	Seq. ID No. 6279	Seq. ID No. 6280
2977b	Seq. ID No. 6281	Seq. ID No. 6282
2978a	Seq. ID No. 6283	Seq. ID No. 6284
2978b	Seq. ID No. 6285	Seq. ID No. 6286
2979	Seq. ID No. 6287	Seq. ID No. 6288
2980c	Seq. ID No. 6293	Seq. ID No. 6294
2980d	Seq. ID No. 6295	Seq. ID No. 6296
2980e	Seq. ID No. 6297	Seq. ID No. 6298
2984	Seq. ID No. 6299	Seq. ID No. 6300
2986c	Seq. ID No. 6305	Seq. ID No. 6306
2988b	Seq. ID No. 6309	Seq. ID No. 6310
2988c	Seq. ID No. 6311	Seq. ID No. 6312
2990	Seq. ID No. 6315	Seq. ID No. 6316
2991a	Seq. ID No. 6317	Seq. ID No. 6318
2991b	Seq. ID No. 6319	Seq. ID No. 6320
2991c	Seq. ID No. 6321	Seq. ID No. 6322

TABLE 20: WYETH ORFs

ORF Number	DNA SEQ ID Number	Protein SEQ ID Number
2992	Seq. ID No. 6323	Seq. ID No. 6324
2993a	Seq. ID No. 6325	Seq. ID No. 6326
2993b	Seq. ID No. 6327	Seq. ID No. 6328
2995a	Seq. ID No. 6329	Seq. ID No. 6330
2995b	Seq. ID No. 6331	Seq. ID No. 6332
2998a	Seq. ID No. 6335	Seq. ID No. 6336
2998b	Seq. ID No. 6337	Seq. ID No. 6338
3001	Seq. ID No. 6341	Seq. ID No. 6342
3005	Seq. ID No. 6345	Seq. ID No. 6346
3008b	Seq. ID No. 6349	Seq. ID No. 6350
3008c	Seq. ID No. 6351	Seq. ID No. 6352
3008d	Seq. ID No. 6353	Seq. ID No. 6354
3012	Seq. ID No. 6359	Seq. ID No. 6360
3015	Seq. ID No. 6361	Seq. ID No. 6362
3016c	Seq. ID No. 6367	Seq. ID No. 6368
3017	Seq. ID No. 6369	Seq. ID No. 6370
3018a	Seq. ID No. 6371	Seq. ID No. 6372
3018b	Seq. ID No. 6373	Seq. ID No. 6374
3020	Seq. ID No. 6375	Seq. ID No. 6376
3021	Seq. ID No. 6377	Seq. ID No. 6378
3022	Seq. ID No. 6379	Seq. ID No. 6380
3023	Seq. ID No. 6381	Seq. ID No. 6382
3024b	Seq. ID No. 6385	Seq. ID No. 6386
3026b	Seq. ID No. 6389	Seq. ID No. 6390
3028b	Seq. ID No. 6393	Seq. ID No. 6394
3028c	Seq. ID No. 6395	Seq. ID No. 6396
3029b	Seq. ID No. 6399	Seq. ID No. 6400
3033a	Seq. ID No. 6409	Seq. ID No. 6410
3033b	Seq. ID No. 6411	Seq. ID No. 6412

TABLE 20: WYETH ORFS

ORF Number	DNA SEQ ID Number	Protein SEQ ID Number
3035	Seq. ID No. 6413	Seq. ID No. 6414
3037b	Seq. ID No. 6417	Seq. ID No. 6418
3040a	Seq. ID No. 6421	Seq. ID No. 6422
3040b	Seq. ID No. 6423	Seq. ID No. 6424
3042a	Seq. ID No. 6425	Seq. ID No. 6426
3042b	Seq. ID No. 6427	Seq. ID No. 6428
3043a	Seq. ID No. 6429	Seq. ID No. 6430
3043b	Seq. ID No. 6431	Seq. ID No. 6432
3049a	Seq. ID No. 6441	Seq. ID No. 6442
3049b	Seq. ID No. 6443	Seq. ID No. 6444
3049c	Seq. ID No. 6445	Seq. ID No. 6446
3052	Seq. ID No. 6451	Seq. ID No. 6452
3054	Seq. ID No. 6453	Seq. ID No. 6454
3057	Seq. ID No. 6459	Seq. ID No. 6460
3059	Seq. ID No. 6461	Seq. ID No. 6462
3060	Seq. ID No. 6463	Seq. ID No. 6464
3061	Seq. ID No. 6465	Seq. ID No. 6466
3062	Seq. ID No. 6467	Seq. ID No. 6468
3063a	Seq. ID No. 6469	Seq. ID No. 6470
3063b	Seq. ID No. 6471	Seq. ID No. 6472
3064b	Seq. ID No. 6473	Seq. ID No. 6474
3066	Seq. ID No. 6479	Seq. ID No. 6480
3068	Seq. ID No. 6483	Seq. ID No. 6484
3074	Seq. ID No. 6493	Seq. ID No. 6494
3075	Seq. ID No. 6495	Seq. ID No. 6496
3076	Seq. ID No. 6497	Seq. ID No. 6498
3077b	Seq. ID No. 6501	Seq. ID No. 6502
3077c	Seq. ID No. 6503	Seq. ID No. 6504
3078	Seq. ID No. 6505	Seq. ID No. 6506

TABLE 20: WYETH ORFs

ORF Number	DNA SEQ ID Number	Protein SEQ ID Number
3079	Seq. ID No. 6507	Seq. ID No. 6508
3081b	Seq. ID No. 6511	Seq. ID No. 6512
3085	Seq. ID No. 6517	Seq. ID No. 6518
3087c	Seq. ID No. 6523	Seq. ID No. 6524
3088	Seq. ID No. 6525	Seq. ID No. 6526
3092a	Seq. ID No. 6535	Seq. ID No. 6536
3092b	Seq. ID No. 6537	Seq. ID No. 6538
3095	Seq. ID No. 6539	Seq. ID No. 6540
3096a	Seq. ID No. 6541	Seq. ID No. 6542
3096b	Seq. ID No. 6543	Seq. ID No. 6544
3097	Seq. ID No. 6545	Seq. ID No. 6546
3098a	Seq. ID No. 6547	Seq. ID No. 6548
3098b	Seq. ID No. 6549	Seq. ID No. 6550
3098c	Seq. ID No. 6551	Seq. ID No. 6552
3099	Seq. ID No. 6553	Seq. ID No. 6554
3100a	Seq. ID No. 6555	Seq. ID No. 6556
3100b	Seq. ID No. 6557	Seq. ID No. 6558
3101	Seq. ID No. 6559	Seq. ID No. 6560
3103b	Seq. ID No. 6563	Seq. ID No. 6564
3107b	Seq. ID No. 6573	Seq. ID No. 6574
3108a	Seq. ID No. 6575	Seq. ID No. 6576
3108b	Seq. ID No. 6577	Seq. ID No. 6578
3109	Seq. ID No. 6579	Seq. ID No. 6580
3110b	Seq. ID No. 6583	Seq. ID No. 6584
3113	Seq. ID No. 6585	Seq. ID No. 6586
3116	Seq. ID No. 6587	Seq. ID No. 6588
3118b	Seq. ID No. 6591	Seq. ID No. 6592
3119c	Seq. ID No. 6597	Seq. ID No. 6598
3119e	Seq. ID No. 6601	Seq. ID No. 6602

TABLE 20: WYETH ORFs

ORF Number	DNA SEQ ID Number	Protein SEQ ID Number
3119f	Seq. ID No. 6603	Seq. ID No. 6604
3121	Seq. ID No. 6605	Seq. ID No. 6606
3122b	Seq. ID No. 6609	Seq. ID No. 6610
3123a	Seq. ID No. 6611	Seq. ID No. 6612
3123b	Seq. ID No. 6613	Seq. ID No. 6614
3124	Seq. ID No. 6615	Seq. ID No. 6616
3126	Seq. ID No. 6617	Seq. ID No. 6618
3129a	Seq. ID No. 6619	Seq. ID No. 6620
3129b	Seq. ID No. 6621	Seq. ID No. 6622
3131	Seq. ID No. 6623	Seq. ID No. 6624
3134b	Seq. ID No. 6627	Seq. ID No. 6628
3138	Seq. ID No. 6629	Seq. ID No. 6630
3140	Seq. ID No. 6631	Seq. ID No. 6632
3141	Seq. ID No. 6633	Seq. ID No. 6634
3145b	Seq. ID No. 6637	Seq. ID No. 6638
3145c	Seq. ID No. 6639	Seq. ID No. 6640
3147b	Seq. ID No. 6643	Seq. ID No. 6644
3147c	Seq. ID No. 6645	Seq. ID No. 6646
3150a	Seq. ID No. 6649	Seq. ID No. 6650

Listed in Table 21, are 615 ORFs detected by another ORF finder program (Signal Search) of Applicant's assignee that searches for transmembrane regions between two Stop codons and a Start codon immediately upstream of the transmembrane region.

TABLE 21: SIGNAL SEARCH ORFs

ORF Number	DNA SEQ ID Number	Protein SEQ ID Number
4a	Seq. ID No. 7	Seq. ID No. 8
4b	Seq. ID No. 9	Seq. ID No. 10

TABLE 21: SIGNAL SEARCH ORFs

ORF Number	DNA SEQ ID Number	Protein SEQ ID Number
23a	Seq. ID No. 33	Seq. ID No. 34
38b	Seq. ID No. 47	Seq. ID No. 48
44b	Seq. ID No. 67	Seq. ID No. 68
51a	Seq. ID No. 85	Seq. ID No. 86
51b	Seq. ID No. 87	Seq. ID No. 88
66a	Seq. ID No. 123	Seq. ID No. 124
73b	Seq. ID No. 133	Seq. ID No. 134
80a	Seq. ID No. 141	Seq. ID No. 142
86	Seq. ID No. 159	Seq. ID No. 160
87b	Seq. ID No. 163	Seq. ID No. 164
99	Seq. ID No. 191	Seq. ID No. 192
109a	Seq. ID No. 209	Seq. ID No. 210
109b	Seq. ID No. 211	Seq. ID No. 212
109d	Seq. ID No. 215	Seq. ID No. 216
111a	Seq. ID No. 217	Seq. ID No. 218
114	Seq. ID No. 225	Seq. ID No. 226
124a	Seq. ID No. 235	Seq. ID No. 236
124b	Seq. ID No. 237	Seq. ID No. 238
129a	Seq. ID No. 249	Seq. ID No. 250
129b	Seq. ID No. 251	Seq. ID No. 252
132a	Seq. ID No. 255	Seq. ID No. 256
138a	Seq. ID No. 271	Seq. ID No. 272
143	Seq. ID No. 277	Seq. ID No. 278
145a	Seq. ID No. 285	Seq. ID No. 286
145b	Seq. ID No. 287	Seq. ID No. 288
145c	Seq. ID No. 289	Seq. ID No. 290
162a	Seq. ID No. 327	Seq. ID No. 328
162b	Seq. ID No. 329	Seq. ID No. 330
180a	Seq. ID No. 373	Seq. ID No. 374

TABLE 21: SIGNAL SEARCH ORFs

ORF Number	DNA SEQ ID Number	Protein SEQ ID Number
180b	Seq. ID No. 375	Seq. ID No. 376
201a	Seq. ID No. 419	Seq. ID No. 420
239a	Seq. ID No. 487	Seq. ID No. 488
245a	Seq. ID No. 497	Seq. ID No. 498
245b	Seq. ID No. 499	Seq. ID No. 500
246a	Seq. ID No. 503	Seq. ID No. 504
246b	Seq. ID No. 505	Seq. ID No. 506
248a	Seq. ID No. 509	Seq. ID No. 510
248b	Seq. ID No. 511	Seq. ID No. 512
249b	Seq. ID No. 515	Seq. ID No. 516
255a	Seq. ID No. 525	Seq. ID No. 526
255b	Seq. ID No. 527	Seq. ID No. 528
263a	Seq. ID No. 545	Seq. ID No. 546
273a	Seq. ID No. 567	Seq. ID No. 568
273b	Seq. ID No. 569	Seq. ID No. 570
277c	Seq. ID No. 575	Seq. ID No. 576
279a	Seq. ID No. 577	Seq. ID No. 578
279b	Seq. ID No. 579	Seq. ID No. 580
283b	Seq. ID No. 593	Seq. ID No. 594
297	Seq. ID No. 617	Seq. ID No. 618
311	Seq. ID No. 637	Seq. ID No. 638
313a	Seq. ID No. 639	Seq. ID No. 640
313b	Seq. ID No. 641	Seq. ID No. 642
313d	Seq. ID No. 645	Seq. ID No. 646
317a	Seq. ID No. 653	Seq. ID No. 654
317b	Seq. ID No. 655	Seq. ID No. 656
318b	Seq. ID No. 659	Seq. ID No. 660
321	Seq. ID No. 669	Seq. ID No. 670
324	Seq. ID No. 675	Seq. ID No. 676

TABLE 21: SIGNAL SEARCH ORFS

ORF Number	DNA SEQ ID Number	Protein SEQ ID Number
327a	Seq. ID No. 677	Seq. ID No. 678
327b	Seq. ID No. 679	Seq. ID No. 680
342a	Seq. ID No. 715	Seq. ID No. 716
342b	Seq. ID No. 717	Seq. ID No. 718
342c	Seq. ID No. 719	Seq. ID No. 720
342d	Seq. ID No. 721	Seq. ID No. 722
342e	Seq. ID No. 723	Seq. ID No. 724
349c	Seq. ID No. 747	Seq. ID No. 748
350b	Seq. ID No. 751	Seq. ID No. 752
352a	Seq. ID No. 755	Seq. ID No. 756
352b	Seq. ID No. 757	Seq. ID No. 758
352c	Seq. ID No. 759	Seq. ID No. 760
354a	Seq. ID No. 761	Seq. ID No. 762
354b	Seq. ID No. 763	Seq. ID No. 764
356a	Seq. ID No. 769	Seq. ID No. 770
358a	Seq. ID No. 777	Seq. ID No. 778
358b	Seq. ID No. 779	Seq. ID No. 780
372d	Seq. ID No. 807	Seq. ID No. 808
374	Seq. ID No. 809	Seq. ID No. 810
382b	Seq. ID No. 819	Seq. ID No. 820
384a	Seq. ID No. 825	Seq. ID No. 826
403b	Seq. ID No. 863	Seq. ID No. 864
418a	Seq. ID No. 893	Seq. ID No. 894
419c	Seq. ID No. 901	Seq. ID No. 902
431	Seq. ID No. 935	Seq. ID No. 936
437c	Seq. ID No. 943	Seq. ID No. 944
441b	Seq. ID No. 955	Seq. ID No. 956
448	Seq. ID No. 967	Seq. ID No. 968
452b	Seq. ID No. 979	Seq. ID No. 980

TABLE 21: SIGNAL SEARCH ORFs

ORF Number	DNA SEQ ID Number	Protein SEQ ID Number
462	Seq. ID No. 1005	Seq. ID No. 1006
463b	Seq. ID No. 1009	Seq. ID No. 1010
464a	Seq. ID No. 1011	Seq. ID No. 1012
464b	Seq. ID No. 1013	Seq. ID No. 1014
464c	Seq. ID No. 1015	Seq. ID No. 1016
465b	Seq. ID No. 1019	Seq. ID No. 1020
472a	Seq. ID No. 1029	Seq. ID No. 1030
472b	Seq. ID No. 1031	Seq. ID No. 1032
472c	Seq. ID No. 1033	Seq. ID No. 1034
472e	Seq. ID No. 1037	Seq. ID No. 1038
472f	Seq. ID No. 1039	Seq. ID No. 1040
476	Seq. ID No. 1045	Seq. ID No. 1046
480a	Seq. ID No. 1055	Seq. ID No. 1056
492	Seq. ID No. 1075	Seq. ID No. 1076
507a	Seq. ID No. 1105	Seq. ID No. 1106
521b	Seq. ID No. 1131	Seq. ID No. 1132
524a	Seq. ID No. 1135	Seq. ID No. 1136
524b	Seq. ID No. 1137	Seq. ID No. 1138
541a	Seq. ID No. 1165	Seq. ID No. 1166
541b	Seq. ID No. 1167	Seq. ID No. 1168
541c	Seq. ID No. 1169	Seq. ID No. 1170
545a	Seq. ID No. 1183	Seq. ID No. 1184
546c	Seq. ID No. 1193	Seq. ID No. 1194
547b	Seq. ID No. 1197	Seq. ID No. 1198
556	Seq. ID No. 1213	Seq. ID No. 1214
561	Seq. ID No. 1223	Seq. ID No. 1224
564a	Seq. ID No. 1227	Seq. ID No. 1228
564b	Seq. ID No. 1229	Seq. ID No. 1230
570b	Seq. ID No. 1237	Seq. ID No. 1238

TABLE 21: SIGNAL SEARCH ORFs

ORF Number	DNA SEQ ID Number	Protein SEQ ID Number
576a	Seq. ID No. 1243	Seq. ID No. 1244
587a	Seq. ID No. 1265	Seq. ID No. 1266
587b	Seq. ID No. 1267	Seq. ID No. 1268
587c	Seq. ID No. 1269	Seq. ID No. 1270
587d	Seq. ID No. 1271	Seq. ID No. 1272
595a	Seq. ID No. 1283	Seq. ID No. 1284
596a	Seq. ID No. 1287	Seq. ID No. 1288
596c	Seq. ID No. 1291	Seq. ID No. 1292
598b	Seq. ID No. 1297	Seq. ID No. 1298
600b	Seq. ID No. 1305	Seq. ID No. 1306
609a	Seq. ID No. 1315	Seq. ID No. 1316
613a	Seq. ID No. 1325	Seq. ID No. 1326
613b	Seq. ID No. 1327	Seq. ID No. 1328
613c	Seq. ID No. 1329	Seq. ID No. 1330
613d	Seq. ID No. 1331	Seq. ID No. 1332
619a	Seq. ID No. 1341	Seq. ID No. 1342
624c	Seq. ID No. 1353	Seq. ID No. 1354
631c	Seq. ID No. 1367	Seq. ID No. 1368
645	Seq. ID No. 1401	Seq. ID No. 1402
665	Seq. ID No. 1429	Seq. ID No. 1430
674a	Seq. ID No. 1435	Seq. ID No. 1436
679a	Seq. ID No. 1445	Seq. ID No. 1446
700a	Seq. ID No. 1481	Seq. ID No. 1482
722a	Seq. ID No. 1513	Seq. ID No. 1514
722b	Seq. ID No. 1515	Seq. ID No. 1516
722c	Seq. ID No. 1517	Seq. ID No. 1518
728a	Seq. ID No. 1529	Seq. ID No. 1530
730a	Seq. ID No. 1533	Seq. ID No. 1534
730b	Seq. ID No. 1535	Seq. ID No. 1536

TABLE 21: SIGNAL SEARCH ORFS

ORF Number	DNA SEQ ID Number	Protein SEQ ID Number
738a	Seq. ID No. 1545	Seq. ID No. 1546
738b	Seq. ID No. 1547	Seq. ID No. 1548
739	Seq. ID No. 1551	Seq. ID No. 1552
743a	Seq. ID No. 1559	Seq. ID No. 1560
744	Seq. ID No. 1563	Seq. ID No. 1564
746b	Seq. ID No. 1571	Seq. ID No. 1572
749	Seq. ID No. 1579	Seq. ID No. 1580
754a	Seq. ID No. 1583	Seq. ID No. 1584
754b	Seq. ID No. 1585	Seq. ID No. 1586
772a	Seq. ID No. 1621	Seq. ID No. 1622
779	Seq. ID No. 1633	Seq. ID No. 1634
786b	Seq. ID No. 1643	Seq. ID No. 1644
788a	Seq. ID No. 1645	Seq. ID No. 1646
788b	Seq. ID No. 1647	Seq. ID No. 1648
789a	Seq. ID No. 1649	Seq. ID No. 1650
789c	Seq. ID No. 1653	Seq. ID No. 1654
799a	Seq. ID No. 1671	Seq. ID No. 1672
799b	Seq. ID No. 1673	Seq. ID No. 1674
799d	Seq. ID No. 1677	Seq. ID No. 1678
799f	Seq. ID No. 1681	Seq. ID No. 1682
826	Seq. ID No. 1707	Seq. ID No. 1708
837a	Seq. ID No. 1731	Seq. ID No. 1732
837b	Seq. ID No. 1733	Seq. ID No. 1734
843	Seq. ID No. 1737	Seq. ID No. 1738
853a	Seq. ID No. 1753	Seq. ID No. 1754
853c	Seq. ID No. 1757	Seq. ID No. 1758
859a	Seq. ID No. 1765	Seq. ID No. 1766
859b	Seq. ID No. 1767	Seq. ID No. 1768
868a	Seq. ID No. 1787	Seq. ID No. 1788

TABLE 21: SIGNAL SEARCH ORFs

ORF Number	DNA SEQ ID Number	Protein SEQ ID Number
870	Seq. ID No. 1791	Seq. ID No. 1792
873c	Seq. ID No. 1797	Seq. ID No. 1798
876	Seq. ID No. 1805	Seq. ID No. 1806
885	Seq. ID No. 1819	Seq. ID No. 1820
886	Seq. ID No. 1821	Seq. ID No. 1822
887	Seq. ID No. 1823	Seq. ID No. 1824
908a	Seq. ID No. 1839	Seq. ID No. 1840
929a	Seq. ID No. 1869	Seq. ID No. 1870
931	Seq. ID No. 1875	Seq. ID No. 1876
939a	Seq. ID No. 1891	Seq. ID No. 1892
939b	Seq. ID No. 1893	Seq. ID No. 1894
939c	Seq. ID No. 1895	Seq. ID No. 1896
952b	Seq. ID No. 1923	Seq. ID No. 1924
955a	Seq. ID No. 1927	Seq. ID No. 1928
977a	Seq. ID No. 1969	Seq. ID No. 1970
981a	Seq. ID No. 1981	Seq. ID No. 1982
987	Seq. ID No. 1991	Seq. ID No. 1992
988a	Seq. ID No. 1993	Seq. ID No. 1994
998a	Seq. ID No. 2013	Seq. ID No. 2014
999a	Seq. ID No. 2017	Seq. ID No. 2018
1003b	Seq. ID No. 2027	Seq. ID No. 2028
1006a	Seq. ID No. 2033	Seq. ID No. 2034
1013a	Seq. ID No. 2041	Seq. ID No. 2042
1017a	Seq. ID No. 2049	Seq. ID No. 2050
1017c	Seq. ID No. 2053	Seq. ID No. 2054
1036a	Seq. ID No. 2087	Seq. ID No. 2088
1036b	Seq. ID No. 2089	Seq. ID No. 2090
1044a	Seq. ID No. 2105	Seq. ID No. 2106
1047b	Seq. ID No. 2115	Seq. ID No. 2116

TABLE 21: SIGNAL SEARCH ORFs

ORF Number	DNA SEQ ID Number	Protein SEQ ID Number
1050a	Seq. ID No. 2121	Seq. ID No. 2122
1050d	Seq. ID No. 2127	Seq. ID No. 2128
1065b	Seq. ID No. 2151	Seq. ID No. 2152
1067	Seq. ID No. 2159	Seq. ID No. 2160
1077a	Seq. ID No. 2171	Seq. ID No. 2172
1077b	Seq. ID No. 2173	Seq. ID No. 2174
1077d	Seq. ID No. 2177	Seq. ID No. 2178
1081a	Seq. ID No. 2187	Seq. ID No. 2188
1111a	Seq. ID No. 2237	Seq. ID No. 2238
1111b	Seq. ID No. 2239	Seq. ID No. 2240
1125	Seq. ID No. 2245	Seq. ID No. 2246
1126b	Seq. ID No. 2249	Seq. ID No. 2250
1140a	Seq. ID No. 2271	Seq. ID No. 2272
1144a	Seq. ID No. 2283	Seq. ID No. 2284
1146a	Seq. ID No. 2289	Seq. ID No. 2290
1146b	Seq. ID No. 2291	Seq. ID No. 2292
1146c	Seq. ID No. 2293	Seq. ID No. 2294
1146d	Seq. ID No. 2295	Seq. ID No. 2296
1152a	Seq. ID No. 2303	Seq. ID No. 2304
1152b	Seq. ID No. 2305	Seq. ID No. 2306
1152c	Seq. ID No. 2307	Seq. ID No. 2308
1155a	Seq. ID No. 2317	Seq. ID No. 2318
1155b	Seq. ID No. 2319	Seq. ID No. 2320
1155c	Seq. ID No. 2321	Seq. ID No. 2322
1155d	Seq. ID No. 2323	Seq. ID No. 2324
1155e	Seq. ID No. 2325	Seq. ID No. 2326
1155f	Seq. ID No. 2327	Seq. ID No. 2328
1158b	Seq. ID No. 2333	Seq. ID No. 2334
1165	Seq. ID No. 2343	Seq. ID No. 2344

TABLE 21: SIGNAL SEARCH ORFS

ORF Number	DNA SEQ ID Number	Protein SEQ ID Number
1167a	Seq. ID No. 2347	Seq. ID No. 2348
1167b	Seq. ID No. 2349	Seq. ID No. 2350
1168	Seq. ID No. 2351	Seq. ID No. 2352
1169a	Seq. ID No. 2353	Seq. ID No. 2354
1169b	Seq. ID No. 2355	Seq. ID No. 2356
1169c	Seq. ID No. 2357	Seq. ID No. 2358
1172	Seq. ID No. 2365	Seq. ID No. 2366
1180d	Seq. ID No. 2389	Seq. ID No. 2390
1180e	Seq. ID No. 2391	Seq. ID No. 2392
1186a	Seq. ID No. 2407	Seq. ID No. 2408
1192a	Seq. ID No. 2419	Seq. ID No. 2420
1192b	Seq. ID No. 2421	Seq. ID No. 2422
1196b	Seq. ID No. 2427	Seq. ID No. 2428
1197	Seq. ID No. 2429	Seq. ID No. 2430
1199a	Seq. ID No. 2433	Seq. ID No. 2434
1207	Seq. ID No. 2449	Seq. ID No. 2450
1212	Seq. ID No. 2459	Seq. ID No. 2460
1224b	Seq. ID No. 2489	Seq. ID No. 2490
1228a	Seq. ID No. 2497	Seq. ID No. 2498
1229c	Seq. ID No. 2503	Seq. ID No. 2504
1231	Seq. ID No. 2507	Seq. ID No. 2508
1234a	Seq. ID No. 2515	Seq. ID No. 2516
1236a	Seq. ID No. 2523	Seq. ID No. 2524
1237	Seq. ID No. 2525	Seq. ID No. 2526
1241a	Seq. ID No. 2531	Seq. ID No. 2532
1241c	Seq. ID No. 2535	Seq. ID No. 2536
1243	Seq. ID No. 2537	Seq. ID No. 2538
1245a	Seq. ID No. 2541	Seq. ID No. 2542
1245b	Seq. ID No. 2543	Seq. ID No. 2544

TABLE 21: SIGNAL SEARCH ORFs

ORF Number	DNA SEQ ID Number	Protein SEQ ID Number
1245c	Seq. ID No. 2545	Seq. ID No. 2546
1250a	Seq. ID No. 2555	Seq. ID No. 2556
1250b	Seq. ID No. 2557	Seq. ID No. 2558
1253a	Seq. ID No. 2569	Seq. ID No. 2570
1253b	Seq. ID No. 2571	Seq. ID No. 2572
1258a	Seq. ID No. 2583	Seq. ID No. 2584
1260	Seq. ID No. 2591	Seq. ID No. 2592
1266a	Seq. ID No. 2597	Seq. ID No. 2598
1266b	Seq. ID No. 2599	Seq. ID No. 2600
1267a	Seq. ID No. 2601	Seq. ID No. 2602
1268b	Seq. ID No. 2607	Seq. ID No. 2608
1270	Seq. ID No. 2611	Seq. ID No. 2612
1275a	Seq. ID No. 2621	Seq. ID No. 2622
1278b	Seq. ID No. 2629	Seq. ID No. 2630
1288	Seq. ID No. 2651	Seq. ID No. 2652
1308a	Seq. ID No. 2679	Seq. ID No. 2680
1315	Seq. ID No. 2693	Seq. ID No. 2694
1319a	Seq. ID No. 2701	Seq. ID No. 2702
1319b	Seq. ID No. 2703	Seq. ID No. 2704
1320a	Seq. ID No. 2705	Seq. ID No. 2706
1320b	Seq. ID No. 2707	Seq. ID No. 2708
1334b	Seq. ID No. 2731	Seq. ID No. 2732
1335a	Seq. ID No. 2733	Seq. ID No. 2734
1365b	Seq. ID No. 2783	Seq. ID No. 2784
1366a	Seq. ID No. 2785	Seq. ID No. 2786
1381b	Seq. ID No. 2813	Seq. ID No. 2814
1382	Seq. ID No. 2815	Seq. ID No. 2816
1384c	Seq. ID No. 2823	Seq. ID No. 2824
1393a	Seq. ID No. 2835	Seq. ID No. 2836

TABLE 21: SIGNAL SEARCH ORFs

ORF Number	DNA SEQ ID Number	Protein SEQ ID Number
1393b	Seq. ID No. 2837	Seq. ID No. 2838
1393d	Seq. ID No. 2841	Seq. ID No. 2842
1399a	Seq. ID No. 2853	Seq. ID No. 2854
1411a	Seq. ID No. 2873	Seq. ID No. 2874
1411b	Seq. ID No. 2875	Seq. ID No. 2876
1412b	Seq. ID No. 2881	Seq. ID No. 2882
1426a	Seq. ID No. 2905	Seq. ID No. 2906
1438	Seq. ID No. 2935	Seq. ID No. 2936
1439a	Seq. ID No. 2937	Seq. ID No. 2938
1439b	Seq. ID No. 2939	Seq. ID No. 2940
1439c	Seq. ID No. 2941	Seq. ID No. 2942
1440a	Seq. ID No. 2947	Seq. ID No. 2948
1440b	Seq. ID No. 2949	Seq. ID No. 2950
1447a	Seq. ID No. 2969	Seq. ID No. 2970
1448	Seq. ID No. 2973	Seq. ID No. 2974
1449b	Seq. ID No. 2977	Seq. ID No. 2978
1452a	Seq. ID No. 2981	Seq. ID No. 2982
1454	Seq. ID No. 2987	Seq. ID No. 2988
1455b	Seq. ID No. 2991	Seq. ID No. 2992
1457a	Seq. ID No. 2995	Seq. ID No. 2996
1457b	Seq. ID No. 2997	Seq. ID No. 2998
1462b	Seq. ID No. 3005	Seq. ID No. 3006
1463a	Seq. ID No. 3007	Seq. ID No. 3008
1466a	Seq. ID No. 3013	Seq. ID No. 3014
1469a	Seq. ID No. 3023	Seq. ID No. 3024
1469b	Seq. ID No. 3025	Seq. ID No. 3026
1469c	Seq. ID No. 3027	Seq. ID No. 3028
1470a	Seq. ID No. 3029	Seq. ID No. 3030
1470b	Seq. ID No. 3031	Seq. ID No. 3032

TABLE 21: SIGNAL SEARCH ORFs

ORF Number	DNA SEQ ID Number	Protein SEQ ID Number
1475	Seq. ID No. 3043	Seq. ID No. 3044
1479c	Seq. ID No. 3055	Seq. ID No. 3056
1484a	Seq. ID No. 3063	Seq. ID No. 3064
1487	Seq. ID No. 3071	Seq. ID No. 3072
1488a	Seq. ID No. 3073	Seq. ID No. 3074
1488b	Seq. ID No. 3075	Seq. ID No. 3076
1488c	Seq. ID No. 3077	Seq. ID No. 3078
1507c	Seq. ID No. 3123	Seq. ID No. 3124
1517a	Seq. ID No. 3145	Seq. ID No. 3146
1520	Seq. ID No. 3155	Seq. ID No. 3156
1522	Seq. ID No. 3157	Seq. ID No. 3158
1530a	Seq. ID No. 3163	Seq. ID No. 3164
1543	Seq. ID No. 3183	Seq. ID No. 3184
1552	Seq. ID No. 3193	Seq. ID No. 3194
1554b	Seq. ID No. 3201	Seq. ID No. 3202
1557a	Seq. ID No. 3213	Seq. ID No. 3214
1557b	Seq. ID No. 3215	Seq. ID No. 3216
1557c	Seq. ID No. 3217	Seq. ID No. 3218
1559a	Seq. ID No. 3219	Seq. ID No. 3220
1572a	Seq. ID No. 3241	Seq. ID No. 3242
1572b	Seq. ID No. 3243	Seq. ID No. 3244
1572c	Seq. ID No. 3245	Seq. ID No. 3246
1572e	Seq. ID No. 3249	Seq. ID No. 3250
1577b	Seq. ID No. 3257	Seq. ID No. 3258
1580a	Seq. ID No. 3261	Seq. ID No. 3262
1582b	Seq. ID No. 3269	Seq. ID No. 3270
1585a	Seq. ID No. 3275	Seq. ID No. 3276
1594a	Seq. ID No. 3297	Seq. ID No. 3298
1606a	Seq. ID No. 3317	Seq. ID No. 3318

TABLE 21: SIGNAL SEARCH ORFS

ORF Number	DNA SEQ ID Number	Protein SEQ ID Number
1607b	Seq. ID No. 3323	Seq. ID No. 3324
1619	Seq. ID No. 3337	Seq. ID No. 3338
1621	Seq. ID No. 3339	Seq. ID No. 3340
1624	Seq. ID No. 3349	Seq. ID No. 3350
1625a	Seq. ID No. 3351	Seq. ID No. 3352
1625b	Seq. ID No. 3353	Seq. ID No. 3354
1626a	Seq. ID No. 3357	Seq. ID No. 3358
1626b	Seq. ID No. 3359	Seq. ID No. 3360
1634c	Seq. ID No. 3377	Seq. ID No. 3378
1646a	Seq. ID No. 3389	Seq. ID No. 3390
1646b	Seq. ID No. 3391	Seq. ID No. 3392
1646d	Seq. ID No. 3395	Seq. ID No. 3396
1649a	Seq. ID No. 3405	Seq. ID No. 3406
1659a	Seq. ID No. 3421	Seq. ID No. 3422
1659c	Seq. ID No. 3425	Seq. ID No. 3426
1673a	Seq. ID No. 3449	Seq. ID No. 3450
1673b	Seq. ID No. 3451	Seq. ID No. 3452
1673c	Seq. ID No. 3453	Seq. ID No. 3454
1673d	Seq. ID No. 3455	Seq. ID No. 3456
1673e	Seq. ID No. 3457	Seq. ID No. 3458
1675a	Seq. ID No. 3463	Seq. ID No. 3464
1683a	Seq. ID No. 3481	Seq. ID No. 3482
1688a	Seq. ID No. 3491	Seq. ID No. 3492
1688b	Seq. ID No. 3493	Seq. ID No. 3494
1690a	Seq. ID No. 3503	Seq. ID No. 3504
1690b	Seq. ID No. 3505	Seq. ID No. 3506
1699a	Seq. ID No. 3527	Seq. ID No. 3528
1735a	Seq. ID No. 3593	Seq. ID No. 3594
1735b	Seq. ID No. 3595	Seq. ID No. 3596

TABLE 21: SIGNAL SEARCH ORFS

ORF Number	DNA SEQ ID Number	Protein SEQ ID Number
1749a	Seq. ID No. 3621	Seq. ID No. 3622
1750a	Seq. ID No. 3625	Seq. ID No. 3626
1756b	Seq. ID No. 3635	Seq. ID No. 3636
1778b	Seq. ID No. 3679	Seq. ID No. 3680
1798a	Seq. ID No. 3723	Seq. ID No. 3724
1798c	Seq. ID No. 3727	Seq. ID No. 3728
1806b	Seq. ID No. 3745	Seq. ID No. 3746
1808a	Seq. ID No. 3753	Seq. ID No. 3754
1808b	Seq. ID No. 3755	Seq. ID No. 3756
1808c	Seq. ID No. 3757	Seq. ID No. 3758
1809a	Seq. ID No. 3761	Seq. ID No. 3762
1809b	Seq. ID No. 3763	Seq. ID No. 3764
1809c	Seq. ID No. 3765	Seq. ID No. 3766
1812b	Seq. ID No. 3783	Seq. ID No. 3784
1816a	Seq. ID No. 3793	Seq. ID No. 3794
1817a	Seq. ID No. 3799	Seq. ID No. 3800
1825	Seq. ID No. 3813	Seq. ID No. 3814
1838a	Seq. ID No. 3837	Seq. ID No. 3838
1838b	Seq. ID No. 3839	Seq. ID No. 3840
1842a	Seq. ID No. 3849	Seq. ID No. 3850
1842b	Seq. ID No. 3851	Seq. ID No. 3852
1842c	Seq. ID No. 3853	Seq. ID No. 3854
1845a	Seq. ID No. 3859	Seq. ID No. 3860
1845b	Seq. ID No. 3861	Seq. ID No. 3862
1845c	Seq. ID No. 3863	Seq. ID No. 3864
1848a	Seq. ID No. 3865	Seq. ID No. 3866
1854a	Seq. ID No. 3879	Seq. ID No. 3880
1857b	Seq. ID No. 3889	Seq. ID No. 3890
1857c	Seq. ID No. 3891	Seq. ID No. 3892

TABLE 21: SIGNAL SEARCH ORFs

ORF Number	DNA SEQ ID Number	Protein SEQ ID Number
1862a	Seq. ID No. 3903	Seq. ID No. 3904
1873c	Seq. ID No. 3925	Seq. ID No. 3926
1896a	Seq. ID No. 3963	Seq. ID No. 3964
1898a	Seq. ID No. 3973	Seq. ID No. 3974
1898b	Seq. ID No. 3975	Seq. ID No. 3976
1919a	Seq. ID No. 4005	Seq. ID No. 4006
1931a	Seq. ID No. 4025	Seq. ID No. 4026
1931b	Seq. ID No. 4027	Seq. ID No. 4028
1936	Seq. ID No. 4039	Seq. ID No. 4040
1937a	Seq. ID No. 4041	Seq. ID No. 4042
1937b	Seq. ID No. 4043	Seq. ID No. 4044
1937c	Seq. ID No. 4045	Seq. ID No. 4046
1937d	Seq. ID No. 4047	Seq. ID No. 4048
1941b	Seq. ID No. 4061	Seq. ID No. 4062
1946a	Seq. ID No. 4071	Seq. ID No. 4072
1946b	Seq. ID No. 4073	Seq. ID No. 4074
1950	Seq. ID No. 4079	Seq. ID No. 4080
1951a	Seq. ID No. 4081	Seq. ID No. 4082
1951b	Seq. ID No. 4083	Seq. ID No. 4084
1958a	Seq. ID No. 4101	Seq. ID No. 4102
1958b	Seq. ID No. 4103	Seq. ID No. 4104
1960c	Seq. ID No. 4111	Seq. ID No. 4112
1970b	Seq. ID No. 4133	Seq. ID No. 4134
1973	Seq. ID No. 4137	Seq. ID No. 4138
1976	Seq. ID No. 4139	Seq. ID No. 4140
1977c	Seq. ID No. 4145	Seq. ID No. 4146
1980a	Seq. ID No. 4151	Seq. ID No. 4152
2016a	Seq. ID No. 4221	Seq. ID No. 4222
2016b	Seq. ID No. 4223	Seq. ID No. 4224

TABLE 21: SIGNAL SEARCH ORFs

ORF Number	DNA SEQ ID Number	Protein SEQ ID Number
2016c	Seq. ID No. 4225	Seq. ID No. 4226
2016d	Seq. ID No. 4227	Seq. ID No. 4228
2016f	Seq. ID No. 4231	Seq. ID No. 4232
2023a	Seq. ID No. 4241	Seq. ID No. 4242
2024b	Seq. ID No. 4247	Seq. ID No. 4248
2025	Seq. ID No. 4253	Seq. ID No. 4254
2030a	Seq. ID No. 4257	Seq. ID No. 4258
2030c	Seq. ID No. 4261	Seq. ID No. 4262
2056	Seq. ID No. 4307	Seq. ID No. 4308
2059a	Seq. ID No. 4311	Seq. ID No. 4312
2059b	Seq. ID No. 4313	Seq. ID No. 4314
2074b	Seq. ID No. 4343	Seq. ID No. 4344
2092	Seq. ID No. 4379	Seq. ID No. 4380
2096a	Seq. ID No. 4385	Seq. ID No. 4386
2096c	Seq. ID No. 4389	Seq. ID No. 4390
2120b	Seq. ID No. 4439	Seq. ID No. 4440
2140a	Seq. ID No. 4469	Seq. ID No. 4470
2142a	Seq. ID No. 4473	Seq. ID No. 4474
2146	Seq. ID No. 4481	Seq. ID No. 4482
2147a	Seq. ID No. 4483	Seq. ID No. 4484
2147b	Seq. ID No. 4485	Seq. ID No. 4486
2150c	Seq. ID No. 4497	Seq. ID No. 4498
2159b	Seq. ID No. 4515	Seq. ID No. 4516
2165	Seq. ID No. 4533	Seq. ID No. 4534
2190a	Seq. ID No. 4587	Seq. ID No. 4588
2219a	Seq. ID No. 4639	Seq. ID No. 4640
2219c	Seq. ID No. 4643	Seq. ID No. 4644
2236a	Seq. ID No. 4681	Seq. ID No. 4682
2249	Seq. ID No. 4705	Seq. ID No. 4706

TABLE 21: SIGNAL SEARCH ORFS

ORF Number	DNA SEQ ID Number	Protein SEQ ID Number
2253a	Seq. ID No. 4707	Seq. ID No. 4708
2253b	Seq. ID No. 4709	Seq. ID No. 4710
2253c	Seq. ID No. 4711	Seq. ID No. 4712
2255a	Seq. ID No. 4715	Seq. ID No. 4716
2255b	Seq. ID No. 4717	Seq. ID No. 4718
2264b	Seq. ID No. 4737	Seq. ID No. 4738
2276a	Seq. ID No. 4759	Seq. ID No. 4760
2300	Seq. ID No. 4813	Seq. ID No. 4814
2308	Seq. ID No. 4827	Seq. ID No. 4828
2329a	Seq. ID No. 4869	Seq. ID No. 4870
2329b	Seq. ID No. 4871	Seq. ID No. 4872
2329c	Seq. ID No. 4873	Seq. ID No. 4874
2329d	Seq. ID No. 4875	Seq. ID No. 4876
2357	Seq. ID No. 4919	Seq. ID No. 4920
2363b	Seq. ID No. 4931	Seq. ID No. 4932
2371a	Seq. ID No. 4949	Seq. ID No. 4950
2372	Seq. ID No. 4951	Seq. ID No. 4952
2390	Seq. ID No. 4987	Seq. ID No. 4988
2412	Seq. ID No. 5031	Seq. ID No. 5032
2423a	Seq. ID No. 5061	Seq. ID No. 5062
2434	Seq. ID No. 5085	Seq. ID No. 5086
2445	Seq. ID No. 5103	Seq. ID No. 5104
2456c	Seq. ID No. 5123	Seq. ID No. 5124
2458a	Seq. ID No. 5129	Seq. ID No. 5130
2458b	Seq. ID No. 5131	Seq. ID No. 5132
2458d	Seq. ID No. 5135	Seq. ID No. 5136
2458e	Seq. ID No. 5137	Seq. ID No. 5138
2458g	Seq. ID No. 5141	Seq. ID No. 5142
2469b	Seq. ID No. 5165	Seq. ID No. 5166

TABLE 21: SIGNAL SEARCH ORFs

ORF Number	DNA SEQ ID Number	Protein SEQ ID Number
2474b	Seq. ID No. 5175	Seq. ID No. 5176
2484b	Seq. ID No. 5199	Seq. ID No. 5200
2490	Seq. ID No. 5205	Seq. ID No. 5206
2492a	Seq. ID No. 5207	Seq. ID No. 5208
2495a	Seq. ID No. 5213	Seq. ID No. 5214
2497b	Seq. ID No. 5219	Seq. ID No. 5220
2500a	Seq. ID No. 5223	Seq. ID No. 5224
2518a	Seq. ID No. 5267	Seq. ID No. 5268
2521	Seq. ID No. 5281	Seq. ID No. 5282
2567a	Seq. ID No. 5385	Seq. ID No. 5386
2567b	Seq. ID No. 5387	Seq. ID No. 5388
2587a	Seq. ID No. 5413	Seq. ID No. 5414
2587b	Seq. ID No. 5415	Seq. ID No. 5416
2596	Seq. ID No. 5433	Seq. ID No. 5434
2610	Seq. ID No. 5453	Seq. ID No. 5454
2616a	Seq. ID No. 5459	Seq. ID No. 5460
2616b	Seq. ID No. 5461	Seq. ID No. 5462
2616c	Seq. ID No. 5463	Seq. ID No. 5464
2616d	Seq. ID No. 5465	Seq. ID No. 5466
2623b	Seq. ID No. 5491	Seq. ID No. 5492
2625a	Seq. ID No. 5497	Seq. ID No. 5498
2628	Seq. ID No. 5509	Seq. ID No. 5510
2629b	Seq. ID No. 5513	Seq. ID No. 5514
2633d	Seq. ID No. 5525	Seq. ID No. 5526
2637b	Seq. ID No. 5531	Seq. ID No. 5532
2660	Seq. ID No. 5569	Seq. ID No. 5570
2669a	Seq. ID No. 5587	Seq. ID No. 5588
2673	Seq. ID No. 5595	Seq. ID No. 5596
2674a	Seq. ID No. 5597	Seq. ID No. 5598

TABLE 21: SIGNAL SEARCH ORFS

ORF Number	DNA SEQ ID Number	Protein SEQ ID Number
2679a	Seq. ID No. 5609	Seq. ID No. 5610
2679b	Seq. ID No. 5611	Seq. ID No. 5612
2680c	Seq. ID No. 5621	Seq. ID No. 5622
2683a	Seq. ID No. 5623	Seq. ID No. 5624
2688a	Seq. ID No. 5633	Seq. ID No. 5634
2688c	Seq. ID No. 5637	Seq. ID No. 5638
2690a	Seq. ID No. 5643	Seq. ID No. 5644
2692b	Seq. ID No. 5649	Seq. ID No. 5650
2696a	Seq. ID No. 5659	Seq. ID No. 5660
2718b	Seq. ID No. 5683	Seq. ID No. 5684
2718c	Seq. ID No. 5685	Seq. ID No. 5686
2723	Seq. ID No. 5699	Seq. ID No. 5700
2725b	Seq. ID No. 5705	Seq. ID No. 5706
2728a	Seq. ID No. 5709	Seq. ID No. 5710
2738a	Seq. ID No. 5729	Seq. ID No. 5730
2738c	Seq. ID No. 5733	Seq. ID No. 5734
2749a	Seq. ID No. 5763	Seq. ID No. 5764
2749b	Seq. ID No. 5765	Seq. ID No. 5766
2749c	Seq. ID No. 5767	Seq. ID No. 5768
2749e	Seq. ID No. 5771	Seq. ID No. 5772
2757b	Seq. ID No. 5783	Seq. ID No. 5784
2758d	Seq. ID No. 5791	Seq. ID No. 5792
2760a	Seq. ID No. 5797	Seq. ID No. 5798
2796a	Seq. ID No. 5885	Seq. ID No. 5886
2799a	Seq. ID No. 5889	Seq. ID No. 5890
2801a	Seq. ID No. 5893	Seq. ID No. 5894
2801b	Seq. ID No. 5895	Seq. ID No. 5896
2805a	Seq. ID No. 5899	Seq. ID No. 5900
2805b	Seq. ID No. 5901	Seq. ID No. 5902

TABLE 21: SIGNAL SEARCH ORFs

ORF Number	DNA SEQ ID Number	Protein SEQ ID Number
2810a	Seq. ID No. 5905	Seq. ID No. 5906
2810c	Seq. ID No. 5909	Seq. ID No. 5910
2818a	Seq. ID No. 5921	Seq. ID No. 5922
2818b	Seq. ID No. 5923	Seq. ID No. 5924
2818d	Seq. ID No. 5927	Seq. ID No. 5928
2822a	Seq. ID No. 5939	Seq. ID No. 5940
2869c	Seq. ID No. 6027	Seq. ID No. 6028
2881	Seq. ID No. 6043	Seq. ID No. 6044
2883a	Seq. ID No. 6047	Seq. ID No. 6048
2887a	Seq. ID No. 6059	Seq. ID No. 6060
2891a	Seq. ID No. 6067	Seq. ID No. 6068
2900b	Seq. ID No. 6089	Seq. ID No. 6090
2901a	Seq. ID No. 6091	Seq. ID No. 6092
2909b	Seq. ID No. 6107	Seq. ID No. 6108
2909d	Seq. ID No. 6111	Seq. ID No. 6112
2913b	Seq. ID No. 6117	Seq. ID No. 6118
2931a	Seq. ID No. 6161	Seq. ID No. 6162
2931b	Seq. ID No. 6163	Seq. ID No. 6164
2931c	Seq. ID No. 6165	Seq. ID No. 6166
2933b	Seq. ID No. 6169	Seq. ID No. 6170
2941a	Seq. ID No. 6183	Seq. ID No. 6184
2941b	Seq. ID No. 6185	Seq. ID No. 6186
2943a	Seq. ID No. 6189	Seq. ID No. 6190
2943b	Seq. ID No. 6191	Seq. ID No. 6192
2944b	Seq. ID No. 6197	Seq. ID No. 6198
2948a	Seq. ID No. 6203	Seq. ID No. 6204
2948b	Seq. ID No. 6205	Seq. ID No. 6206
2948d	Seq. ID No. 6209	Seq. ID No. 6210
2955a	Seq. ID No. 6221	Seq. ID No. 6222

TABLE 21: SIGNAL SEARCH ORFs

ORF Number	DNA SEQ ID Number	Protein SEQ ID Number
2955b	Seq. ID No. 6223	Seq. ID No. 6224
2955c	Seq. ID No. 6225	Seq. ID No. 6226
2955d	Seq. ID No. 6227	Seq. ID No. 6228
2955e	Seq. ID No. 6229	Seq. ID No. 6230
2957	Seq. ID No. 6235	Seq. ID No. 6236
2958a	Seq. ID No. 6237	Seq. ID No. 6238
2959	Seq. ID No. 6243	Seq. ID No. 6244
2960a	Seq. ID No. 6245	Seq. ID No. 6246
2962b	Seq. ID No. 6249	Seq. ID No. 6250
2965a	Seq. ID No. 6253	Seq. ID No. 6254
2969	Seq. ID No. 6263	Seq. ID No. 6264
2970a	Seq. ID No. 6265	Seq. ID No. 6266
2974a	Seq. ID No. 6273	Seq. ID No. 6274
2974b	Seq. ID No. 6275	Seq. ID No. 6276
2978b	Seq. ID No. 6285	Seq. ID No. 6286
2980a	Seq. ID No. 6289	Seq. ID No. 6290
2986a	Seq. ID No. 6301	Seq. ID No. 6302
2986b	Seq. ID No. 6303	Seq. ID No. 6304
3016a	Seq. ID No. 6363	Seq. ID No. 6364
3021	Seq. ID No. 6377	Seq. ID No. 6378
3023	Seq. ID No. 6381	Seq. ID No. 6382
3024a	Seq. ID No. 6383	Seq. ID No. 6384
3037a	Seq. ID No. 6415	Seq. ID No. 6416
3042b	Seq. ID No. 6427	Seq. ID No. 6428
3043b	Seq. ID No. 6431	Seq. ID No. 6432
3064b	Seq. ID No. 6473	Seq. ID No. 6474
3076	Seq. ID No. 6497	Seq. ID No. 6498
3107a	Seq. ID No. 6571	Seq. ID No. 6572
3110a	Seq. ID No. 6581	Seq. ID No. 6582

TABLE 21: SIGNAL SEARCH ORFS

ORF Number	DNA SEQ ID Number	Protein SEQ ID Number
3119a	Seq. ID No. 6593	Seq. ID No. 6594
3119d	Seq. ID No. 6599	Seq. ID No. 6600
3140	Seq. ID No. 6631	Seq. ID No. 6632
3145c	Seq. ID No. 6639	Seq. ID No. 6640

B. *ALLOIOCOCCUS OTITIDIS* ORF POLYNUCLEOTIDES ENCODING SURFACE EXPOSED POLYPEPTIDES

Isolated and purified *Alloiococcus otitidis* ORF polynucleotides of the present invention are contemplated for use in the production of *Alloiococcus otitidis* polypeptides. More specifically, in certain embodiments, the ORFs encode *Alloiococcus otitidis* surface exposed polypeptides, particularly antigenic polypeptides. Thus, in one aspect, the present invention provides isolated and purified polynucleotides (ORFs) that encode *Alloiococcus otitidis* surface exposed polypeptides. In particular embodiments, a polynucleotide of the present invention is a DNA molecule, wherein the DNA may be genomic DNA, plasmid DNA or cDNA. In a preferred embodiment, a polynucleotide of the present invention is a recombinant polynucleotide, which encodes an *Alloiococcus otitidis* polypeptide comprising an amino acid sequence that has at least 70% identity to an amino acid sequence of one of the even numbered sequences set forth in SEQ ID NO: 2 through SEQ ID NO: 6650 or a fragment thereof. In another embodiment, an isolated and purified ORF polynucleotide comprises a nucleotide sequence that has at least 70% identity to one of the ORF polynucleotide nucleotide sequences of odd numbered sequences set forth in SEQ ID NO: 1 through SEQ ID NO: 6649, a degenerate variant thereof, or a complement thereof. In yet another embodiment, an ORF polynucleotide of one of the odd numbered sequences set forth in SEQ ID NO: 1 through SEQ ID NO: 6649 is comprised in a plasmid vector and expressed in a host cell. In a preferred embodiment, the host cell is a prokaryotic host cell.

As used herein, the term "polynucleotide" means a sequence of nucleotides connected by phosphodiester linkages. It is well understood that in all prokaryotes studied to date, including *Alloiococcus otitidis*, most or all cellular genetic material is

contained within a single circular chromosome. The single circular chromosome is usually comprised of double stranded DNA, wherein the ORFs encoding polypeptides may be represented on either strand of the bacterial chromosome in a head to tail or a head to head orientation. Polynucleotides are presented herein from the 5' to the 3' direction. A polynucleotide of the present invention can comprise from about 10 nucleotides to about several hundred thousand nucleotides. Preferably, a polynucleotide comprises from about 10 to about 3,000 nucleotides. Preferred lengths of particular polynucleotide are set forth hereinafter.

A polynucleotide of the present invention can be a deoxyribonucleic acid (DNA) molecule, a ribonucleic acid (RNA) molecule, or analogs of the DNA or RNA generated using nucleotide analogs. The nucleic acid molecule can be single-stranded or double-stranded, but preferably is double-stranded DNA. Where a polynucleotide is a DNA molecule, that molecule can be a gene, a cDNA molecule or a genomic DNA molecule. Nucleotide bases are indicated herein by a single letter code: adenine (A), guanine (G), thymine (T) and cytosine (C).

"Isolated" means altered "by the hand of man" from the natural state. An "isolated" composition or substance is one that has been changed or removed from its original environment, or both. For example, a polynucleotide or a polypeptide naturally present in a living animal is not "isolated," but the same polynucleotide or polypeptide separated from the coexisting materials of its natural state is "isolated," as the term is employed herein.

Preferably, an "isolated" polynucleotide is free of sequences, which naturally flank the nucleic acid (*i.e.*, sequences located at the 5' and 3' ends of the nucleic acid) in the genomic DNA of the organism from which the nucleic acid is derived. For example, in various embodiments, the isolated *Alloiococcus otitidis* nucleic acid molecule can contain less than about 5 kb, 4 kb, 3 kb, 2 kb, 1 kb, 0. 5 kb or 0. 1 kb of nucleotide sequences which naturally flank the nucleic acid molecule in genomic DNA of the cell from which the nucleic acid is derived (*e.g.*, neuronal or placenta). However, the *Alloiococcus otitidis* nucleic acid molecule can be fused to heterologous protein encoding or regulatory sequences and still be considered isolated.

ORF polynucleotides of the present invention are obtained using standard cloning and screening techniques from a cDNA library derived from mRNA. Polynucleotides of the invention are also obtained from natural sources such as genomic DNA libraries

(*e.g.*, an *Alloiococcus otitidis* library) or are synthesized using well known and commercially available techniques. As contemplated in the present invention, ORF polynucleotides are obtained using *Alloiococcus otitidis* chromosomal DNA as the template.

The invention further encompasses nucleic acid molecules that differ from the nucleotide sequences shown in one of the odd numbered sequences set forth in SEQ ID NO: 1 through SEQ ID NO: 6649 (and fragments thereof) due to degeneracy of the genetic code, and thus encode the same *Alloiococcus otitidis* polypeptide as that encoded by the nucleotide sequence shown in one of the odd numbered sequences set forth in SEQ ID NO:1 through SEQ ID NO: 6649.

Orthologs and allelic variants of the *Alloiococcus otitidis* polynucleotides are readily identified using methods well known in the art. Allelic variants and orthologs of the polynucleotides comprise a nucleotide sequence that is typically at least about 70-75%, more typically at least about 80-85%, and most typically at least about 90-95% or more homologous to a nucleotide sequence shown in one of the odd numbered sequences set forth in SEQ ID NO:1 through SEQ ID NO: 6649, or a fragment of these nucleotide sequences. Such nucleic acid molecules are readily identified as being able to hybridize, preferably under stringent conditions, to a nucleotide sequence shown in one of the odd numbered sequences set forth in SEQ ID NO:1 through SEQ ID NO: 6649, or a fragment of these nucleotide sequences.

Moreover, the polynucleotides of the invention also comprise only a fragment of the coding region of an *Alloiococcus otitidis* polynucleotide or gene, such as a fragment of and one of the odd numbered sequences set forth in SEQ ID NO:1 through SEQ ID NO: 6649. Preferably, such fragments encode polypeptides, which are immunogenic fragments.

When the ORF polynucleotides of the invention are used for the recombinant production of *Alloiococcus otitidis* polypeptides of the present invention, the polynucleotide may include the coding sequence for the mature polypeptide, by itself, or the coding sequence for the mature polypeptide in reading frame with other coding sequences, such as those encoding a leader or secretory sequence, a pre-, or pro- or prepro- protein sequence, or other fusion peptide portions. For example, a marker sequence, which facilitates purification of the fused polypeptide, can be linked to the coding sequence (*see* Gentz *et al.*, 1989, incorporated herein by reference). Thus,

contemplated in the present invention is the preparation of polynucleotides encoding fusion polypeptides permitting His-tag purification of expression products. The polynucleotide may also contain non-coding 5' and 3' sequences, such as transcribed, non-translated sequences, splicing and polyadenylation signals.

Thus, a polynucleotide encoding a polypeptide of the present invention, including homologs and orthologs from species other than *Alloiococcus otitidis*, is obtained by a process which comprises the steps of screening an appropriate library under stringent hybridization conditions (discussed below) with a labeled probe having the sequence of one of the odd numbered sequences set forth in one of SEQ ID NO:1 through SEQ ID NO: 6649 or a fragment thereof; and isolating full-length cDNA and genomic clones containing the polynucleotide sequence. Such hybridization techniques are well known to the skilled artisan. The skilled artisan will appreciate that, in many cases, an isolated cDNA sequence will be incomplete, in that the region coding for the polypeptide is cut short at the 5' end of the cDNA. This is a consequence of reverse transcriptase, an enzyme with inherently low "processivity" (a measure of the ability of the enzyme to remain attached to the template during the polymerization reaction), failing to complete a DNA copy of the mRNA template during 1st strand cDNA synthesis.

Thus, in certain embodiments, the polynucleotide sequence information provided by the present invention allows for the preparation of relatively short DNA (or RNA) oligonucleotide sequences having the ability to specifically hybridize to gene sequences of the selected polynucleotides disclosed herein. The term "oligonucleotide" as used herein is defined as a molecule comprised of two or more deoxyribonucleotides or ribonucleotides, usually more than three (3), and typically more than ten (10) and up to one hundred (100) or more (although preferably between twenty and thirty). The exact size will depend on many factors, which in turn depends on the ultimate function or use of the oligonucleotide. Thus, in particular embodiments of the invention, nucleic acid probes of an appropriate length are prepared based on a consideration of a selected nucleotide sequence, *e.g.*, a sequence such as that shown in one of odd numbered sequences set forth in SEQ ID NO:1 through SEQ ID NO: 6649. The ability of such nucleic acid probes to specifically hybridize to a polynucleotide encoding an *Alloiococcus otitidis* polypeptide lends them particular utility in a variety of embodiments. Most importantly, the probes are used in a variety of assays for detecting the presence of complementary sequences in a given sample.

In certain embodiments, it is advantageous to use oligonucleotide primers. These primers may be generated in any manner, including chemical synthesis, DNA replication, reverse transcription, or a combination thereof. The sequence of such primers is designed using a polynucleotide of the present invention for use in detecting, amplifying or mutating a defined segment of an ORF polynucleotide that encodes an *Alloiococcus otitidis* polypeptide from prokaryotic cells using polymerase chain reaction (PCR) technology.

In certain embodiments, it is advantageous to employ a polynucleotide of the present invention in combination with an appropriate label for detecting hybrid formation. A wide variety of appropriate labels are known in the art, including radioactive, enzymatic or other ligands, such as avidin/biotin, which are capable of giving a detectable signal.

Polynucleotides which are identical or sufficiently identical to a nucleotide sequence contained in one of odd numbered sequences set forth in SEQ ID NO:1 through SEQ ID NO: 6649, or a fragment thereof, may be used as hybridization probes for cDNA and genomic DNA or as primers for a nucleic acid amplification (PCR) reaction, to isolate full-length cDNAs and genomic clones encoding polypeptides of the present invention and to isolate cDNA and genomic clones of other genes (including genes encoding homologs and orthologs from species other than *Alloiococcus otitidis*) that have a high sequence similarity to polynucleotide sequences set forth in one of the odd numbered sequences set forth in SEQ ID NO:1 through SEQ ID NO:6649, or a fragment thereof. Typically these nucleotide sequences are from at least 70% identical to at least about 70% identical to that of the reference polynucleotide sequence. The probes or primers will generally comprise at least 15 nucleotides, preferably, at least 30 nucleotides and may have at least 50 nucleotides. Particularly preferred probes will have between 30 and 50 nucleotides.

There are several methods available and well known to those skilled in the art to obtain full-length cDNAs, or extend short cDNAs, for example those based on the method of Rapid Amplification of cDNA ends (RACE) (*see*, Frohman *et al.*, 1988). Recent modifications of the technique, exemplified by the Marathon™ technology (BD Biosciences Clontech, Palo Alto, CA) for example, have significantly simplified the search for longer cDNAs. In the Marathon™ technology, cDNAs have been prepared from mRNA extracted from a chosen tissue and an "adaptor" sequence ligated onto each end. Nucleic acid amplification (PCR) is then carried out to amplify the "missing" 5′ end

of the cDNA using a combination of gene specific and adaptor specific oligonucleotide primers. The PCR reaction is then repeated using "nested" primers, that is, primers designed to anneal within the amplified product (typically an adaptor specific primer that anneals further 3' in the adaptor sequence and a gene specific primer that anneals further 5' in the known gene sequence). The products of this reaction are then analyzed by DNA sequencing and a full-length cDNA constructed either by joining the product directly to the existing cDNA to give a complete sequence, or carrying out a separate full-length PCR using the new sequence information for the design of the 5' primer.

To provide certain of the advantages in accordance with the present invention, a preferred nucleic acid sequence employed for hybridization studies or assays includes probe molecules that are complementary to at least a 10 to about 70 long nucleotide stretch of a polynucleotide that encodes an *Alloiococcus otitidis* polypeptide, such as that shown in one of the even numbered sequences set forth in SEQ ID NO: 2 through SEQ ID NO: 6650. A size of at least 10 nucleotides in length helps to ensure that the fragment will be of sufficient length to form a duplex molecule that is both stable and selective. Molecules having complementary sequences over stretches greater than 10 bases in length are generally preferred in order to increase stability and selectivity of the hybrid, and thereby improve the quality and degree of specific hybrid molecules obtained. It is generally preferred to design nucleic acid molecules with gene-complementary stretches of 25 to 40 nucleotides, 55 to 70 nucleotides, or even longer where desired. For example, such fragments are readily prepared by directly synthesizing the fragment by chemical means, by application of nucleic acid reproduction technology, such as the PCR technology (U.S. Patent 4,683,202, incorporated herein by reference), or by excising selected DNA fragments from recombinant plasmids containing appropriate inserts and suitable restriction enzyme sites.

In another aspect, the present invention contemplates an isolated and purified polynucleotide comprising a nucleotide sequence that is identical or complementary to a segment of at least 10 contiguous bases of one of the odd numbered sequences set forth in SEQ ID NO: 1 through SEQ ID NO: 6649, wherein the polynucleotide hybridizes to a polynucleotide that encodes an *Alloiococcus otitidis* polypeptide. Preferably, the isolated and purified polynucleotide comprises a base sequence that is identical or complementary to a segment of at least 25 to 70 contiguous bases of one of the odd numbered sequences set forth in SEQ ID NO: 1 through SEQ ID NO: 6649. For

example, the polynucleotide of the invention can comprise a segment of bases identical or complementary to from 40 to 55 contiguous bases of the disclosed nucleotide sequences.

Accordingly, a polynucleotide probe molecule of the invention is used for its ability to selectively form duplex molecules with complementary stretches of the gene. Depending on the application envisioned, one will desire to employ varying conditions of hybridization stringency to achieve varying degree of selectivity of the probe toward the target sequence (*see* Table 22 below). For applications requiring a high degree of selectivity, one will typically desire to employ relatively stringent conditions to form the hybrids. For some applications, for example, where one desires to prepare mutants employing a mutant primer strand hybridized to an underlying template or where one seeks to isolate an *Alloiococcus otitidis* homologous polypeptide coding sequence from other cells, functional equivalents, or the like, less stringent hybridization conditions are typically needed to allow formation of the heteroduplex (*see* Table 22). Cross-hybridizing species can thereby be readily identified as positively hybridizing signals with respect to control hybridizations. In any case, it is generally appreciated that conditions can be rendered more stringent by the addition of increasing amounts of formamide, which serves to destabilize the hybrid duplex in the same manner as increased temperature. Thus, hybridization conditions can be readily manipulated, and thus will generally be a method of choice depending on the desired results.

The present invention also includes polynucleotides capable of hybridizing under reduced stringency conditions, more preferably stringent conditions, and most preferably highly stringent conditions, to polynucleotides described herein. Examples of stringency conditions are shown in the Table 22 below: highly stringent conditions are those that are at least as stringent as, for example, conditions A-F; stringent conditions are at least as stringent as, for example, conditions G-L; and reduced stringency conditions are at least as stringent as, for example, conditions M-R.

TABLE 22

HYBRIDIZATION STRINGENCY CONDITIONS

Stringency Condition	Polynucleotide Hybrid	Hybrid Length (bp)[I]	Hybridization Temperature and Buffer[H]	Wash Temperature and Buffer[H]
A	DNA:DNA	> 50	65^{0}C; 1xSSC -or- 42 ^{0C}; 1xSSC,	65 ^{0}C; 0.3xSSC

			50% formamide	
B	DNA:DNA	< 50	T_B; 1xSSC	T_B; 1xSSC
C	DNA:RNA	> 50	67 ^{0}C; 1xSSC -or- 45 ^{0}C; 1xSSC, 50% formamide	67 ^{0}C; 0.3xSSC
D	DNA:RNA	< 50	T_D; 1xSSC	T_D; 1xSSC
E	RNA:RNA	> 50	70 ^{0}C; 1xSSC -or- 50 ^{0}C; 1xSSC, 50% formamide	70 ^{0}C; 0.3xSSC
F	RNA:RNA	< 50	T_F; 1xSSC	T_F; 1xSSC
G	DNA:DNA	> 50	65 ^{0}C; 4xSSC -or- 42 ^{0}C; 4xSSC, 50% formamide	65 0; 1xSSC
H	DNA:DNA	< 50	T_H; 4xSSC	T_H; 4xSSC

TABLE 22

HYBRIDIZATION STRINGENCY CONDITIONS

Stringency Condition	Polynucleotide Hybrid	Hybrid Length (bp)[I]	Hybridization Temperature and Buffer[H]	Wash Temperature and Buffer[H]
I	DNA:RNA	> 50	67 °C; 4xSSC -or- 45 °C; 4xSSC, 50% formamide	67 °C; 1xSSC
J	DNA:RNA	< 50	T_J; 4xSSC	T_J; 4xSSC
K	RNA:RNA	> 50	70 °C; 4xSSC -or- 50 °C; 4xSSC, 50% formamide	67 °C; 1xSSC
L	RNA:RNA	< 50	T_L; 2xSSC	T_L; 2xSSC
M	DNA:DNA	> 50	50 °C; 4xSSC -or- 40 °C; 6xSSC, 50% formamide	50 °C; 2xSSC
N	DNA:DNA	< 50	T_N; 6xSSC	T_N; 6xSSC
O	DNA:RNA	> 50	55 °C; 4xSSC -or- 42 °C; 6xSSC, 50% formamide	55 °C; 2xSSC
P	DNA:RNA	< 50	T_P; 6xSSC	T_P; 6xSSC
Q	RNA:RNA	> 50	60 °C; 4xSSC -or- 45 °C; 6xSSC, 50% formamide	60 °C; 2xSSC
R	RNA:RNA	< 50	T_R; 4xSSC	T_R; 4xSSC

(bp)[I]: The hybrid length is that anticipated for the hybridized region(s) of the hybridizing polynucleotides. When hybridizing a polynucleotide to a target polynucleotide of unknown sequence, the hybrid length is assumed to be that of the hybridizing polynucleotide. When polynucleotides of known sequence are hybridized,

the hybrid length is determined by aligning the sequences of the polynucleotides and identifying the region or regions of optimal sequence complementarity.

Buffer^{H}: SSPE (1xSSPE is 0.15M NaCl, 10mM NaH_2PO_4, and 1.25mM EDTA, pH 7.4), can be substituted for SSC (1xSSC is 0.15M NaCl and 15mM sodium citrate) in the hybridization and wash buffers; washes are performed for 15 minutes after hybridization is complete.

T_B through T_R: The hybridization temperature for hybrids anticipated to be less than 50 base pairs in length should be 5-10 ^{0}C less than the melting temperature (T_m) of the hybrid, where T_m is determined according to the following equations. For hybrids less than 18 base pairs in length, T_m(^{0}C) = 2(# of A + T bases) + 4(# of G + C bases). For hybrids between 18 and 49 base pairs in length, T_m(^{0}C) = 81.5 + 16.6($\log_{10}$[Na^+]) + 0.41(%G+C) - (600/N), where N is the number of bases in the hybrid, and [Na^+] is the concentration of sodium ions in the hybridization buffer ([Na^+] for 1xSSC = 0.165 M).

Additional examples of stringency conditions for polynucleotide hybridization are provided in Sambrook *et al.,* 1989, Molecular Cloning: A Laboratory Manual, Cold Spring Harbor Laboratory Press, Cold Spring Harbor, NY, chapters 9 and 11, and Ausubel *et al.,* 1995, Current Protocols in Molecular Biology, Eds., John Wiley & Sons, Inc., sections 2.10 and 6.3-6.4, incorporated herein by reference.

In addition to the nucleic acid molecules encoding *Alloiococcus otitidis* polypeptides described above, another aspect of the invention pertains to isolated nucleic acid molecules that are antisense thereto. An "antisense" nucleic acid comprises a nucleotide sequence that is complementary to a "sense" nucleic acid encoding a protein, *e.g.*, complementary to the coding strand of a double-stranded cDNA molecule or complementary to an mRNA sequence. Accordingly, an antisense nucleic acid can hydrogen bond to a sense nucleic acid. The antisense nucleic acid can be complementary to an entire *Alloiococcus otitidis* coding strand, or to only a fragment thereof. In one embodiment, an antisense nucleic acid molecule is antisense to a "coding region" of the coding strand of a nucleotide sequence encoding an *Alloiococcus otitidis* polypeptide.

The term "coding region" refers to the region of the nucleotide sequence comprising codons which are translated into amino acid residues, *e.g.*, the entire coding region of each of odd numbered sequences set forth in SEQ ID NO: 1 through SEQ ID NO: 6649. In another embodiment, the antisense nucleic acid molecule is antisense to a

"noncoding region" of the coding strand of a nucleotide sequence encoding an *Alloiococcus otitidis* polypeptide. The term "noncoding region" refers to 5' and 3' sequences that flank the coding region that are not translated into amino acids (*i.e.*, also referred to as 5' and 3' untranslated regions).

Given the coding strand sequence encoding the *Alloiococcus otitidis* polypeptides disclosed herein antisense nucleic acids of the invention can be designed according to the rules of Watson and Crick base pairing. The antisense nucleic acid molecule can be complementary to the entire coding region of *Alloiococcus otitidis* mRNA, but more preferably is an oligonucleotide which is antisense to only a fragment of the coding or noncoding region of *Alloiococcus otitidis* mRNA. For example, the antisense oligonucleotide can be complementary to the region surrounding the translation start site of *Alloiococcus otitidis* mRNA.

An antisense oligonucleotide can be, for example, about 5, 10, 15, 20, 25, 30, 35, 40, 45 or 50 nucleotides in length. An antisense nucleic acid of the invention can be constructed using chemical synthesis and enzymatic ligation reactions using procedures known in the art. For example, an antisense nucleic acid (*e.g.*, an antisense oligonucleotide) can be chemically synthesized using naturally occurring nucleotides or variously modified nucleotides designed to increase the biological stability of the molecules or to increase the physical stability of the duplex formed between the antisense and sense nucleic acids, *e.g.*, phosphorothioate derivatives and acridine substituted nucleotides can be used. Examples of modified nucleotides which can be used to generate the antisense nucleic acid include 5-fluorouracil, 5-bromouracil, 5-chlorouracil, 5-iodouracil, hypoxanthine, xanthine, 4-acetylcytosine, 5-(carboxyhydroxylmethyl) uracil, 5-carboxymethylaminomethyl-2-thiouridine, 5-carboxymethylaminomethyluracil, dihydrouracil, beta-D-galactosylqueosine, inosine, N6-isopentenyladenine, l-methylguanine, l-methylinosine, 2,2-dimethylguanine, 2-methyladenine, 2-methylguanine, 3-methylcytosine, 5-methylcytosine, N6-adenine, 7-methylguanine, 5-methylaminomethyluracil, 5-methoxyaminomethyl-2-thiouracil, beta-D-mannosylqueosine, 5'-methoxycarboxymethyluracil, 5-methoxyuracil, 2-methylthio-N6-isopentenyladenine, uracil-5-oxyacetic acid (v), wybutoxosine, pseudouracil, queosine, 2-thiocytosine, 5-methyl-2-thiouracil, 2-thiouracil, 4-thiouracil, 5-methyluracil, uracil-5-oxyacetic acid methylester, uracil-5-oxyacetic acid (v), 5-methyl-2-thiouracil, 3-(3-amino-3-N-2-carboxypropyl) uracil, (acp3)w, and 2,6-diaminopurine.

Alternatively, the antisense nucleic acid can be produced biologically using an expression vector into which a nucleic acid has been subcloned in an antisense orientation (*i.e.*, RNA transcribed from the inserted nucleic acid will be of an antisense orientation to a target nucleic acid of interest, described further in the following subsection).

The antisense nucleic acid molecules of the invention are typically administered to a subject or generated *in situ* such that they hybridize with or bind to cellular mRNA and/or genomic DNA encoding an *Alloiococcus otitidis* polypeptide to thereby inhibit expression of the polypeptide, *e.g.*, by inhibiting transcription and/or translation. The hybridization can be by conventional nucleotide complementarity to form a stable duplex, or, for example, in the case of an antisense nucleic acid molecule which binds to DNA duplexes, through specific interactions in the major groove of the double helix. An example of a route of administration of an antisense nucleic acid molecule of the invention includes direct injection at a tissue site. Alternatively, an antisense nucleic acid molecule can be modified to target selected cells and then administered systemically. For example, for systemic administration, an antisense molecule can be modified such that it specifically binds to a receptor or an antigen expressed on a selected cell surface, *e.g.*, by linking the antisense nucleic acid molecule to a peptide or an antibody which binds to a cell surface receptor or antigen. The antisense nucleic acid molecule can also be delivered to cells using the vectors described herein.

In yet another embodiment, the antisense nucleic acid molecule of the invention is an α-anomeric nucleic acid molecule. An α-anomeric nucleic acid molecule forms specific double-stranded hybrids with complementary RNA in which, contrary to the usual γ-units, the strands run parallel to each other (Gaultier *et al.*, 1987). The antisense nucleic acid molecule can also comprise a 2'-o-methylribonucleotide (Inoue *et al.*, 1987a) or a chimeric RNA-DNA analogue (Inoue *et al.*, 1987b).

In still another embodiment, an antisense nucleic acid of the invention is a ribozyme. Ribozymes are catalytic RNA molecules with ribonuclease activity that are capable of cleaving a single-stranded nucleic acid, such as a mRNA, to which they have a complementary region. Thus, ribozymes (*e.g.*, hammerhead ribozymes described in Haselhoff and Gerlach, 1988) can be used to catalytically cleave *Alloiococcus otitidis* mRNA transcripts to thereby inhibit translation of *Alloiococcus otitidis* mRNA. A ribozyme having specificity for an *Alloiococcus otitidis*-encoding nucleic acid can be

designed based upon the nucleotide sequence of an *Alloiococcus otitidis* cDNA disclosed herein. For example, a derivative of a Tetrahymena L-19 IVS RNA can be constructed in which the nucleotide sequence of the active site is complementary to the nucleotide sequence to be cleaved in an *Alloiococcus otitidis*-encoding mRNA. *See, e.g.*, Cech *et al.* U.S. 4,987,071 and Cech *et al.* U.S. 5,116,742 both incorporated herein in their entirety by reference. Alternatively, *Alloiococcus otitidis* mRNA can be used to select a catalytic RNA having a specific ribonuclease activity from a pool of RNA molecules. *See, e.g.*, Bartel and Szostak, 1993.

Alternatively *Alloiococcus otitidis* gene expression is inhibited by targeting nucleotide sequences complementary to the regulatory region of the *Alloiococcus otitidis* gene (*e.g.*, the *Alloiococcus otitidis* gene promoter and/or enhancers) to form triple helical structures that prevent transcription of the *Alloiococcus otitidis* gene in target cells. (*See* generally, Helene, 1991; Helene *et al.*, 1992; and Maher, 1992).

Alloiococcus otitidis gene expression is also inhibited using RNA interference (RNAi). This is a technique for post-transcriptional gene silencing (PTGS), in which target gene activity is specifically abolished with cognate double-stranded RNA (dsRNA). RNAi resembles in many aspects PTGS in plants and has been detected in many invertebrates including trypanosome, hydra, planaria, nematode and fruit fly (*Drosophila melangnoster*). It may be involved in the modulation of transposable element mobilization and antiviral state formation. RNAi in mammalian systems is disclosed in WO 00/63364, which is incorporated by reference herein in its entirety. Basically, dsRNA of at least about 600 nucleotides, homologous to the target is introduced into the cell and a sequence specific reduction in gene activity is observed.

C. *ALLOIOCOCCUS OTITIDIS* POLYPEPTIDES

In particular embodiments, the present invention provides isolated and purified *Alloiococcus otitidis* polypeptides. Preferably, an *Alloiococcus otitidis* polypeptide of the invention is a recombinant polypeptide. In certain embodiments, an *Alloiococcus otitidis* polypeptide of the present invention comprises the amino acid sequence that has at least 70% identity to the amino acid sequence of one of even numbered sequences set forth in SEQ ID NO: 2 through SEQ ID NO: 6650, a biological equivalent thereof, or a fragment thereof.

An *Alloiococcus otitidis* polypeptide according to the present invention encompasses a polypeptide that comprises: 1) the amino acid sequence shown in one of the even numbered sequences set forth in SEQ ID NO: 2 through SEQ ID NO: 6650); (2) functional and non-functional naturally occurring variants or biological equivalents of *Alloiococcus otitidis* polypeptides of in one of the even numbered sequences set forth in SEQ ID NO: 2 through SEQ ID NO: 6650; (3) recombinantly produced variants or biological equivalents of *Alloiococcus otitidis* polypeptides set out in one of the even numbered sequences set forth in SEQ ID NO: 2 through SEQ ID NO: 6650; (4) polypeptides isolated from organisms other than *Alloiococcus otitidis* (orthologs of *Alloiococcus otitidis* polypeptides).

A biological equivalent or variant of an *Alloiococcus otitidis* polypeptide according to the present invention encompasses 1) a polypeptide isolated from *Alloiococcus otitidis*; and 2) a polypeptide that contains substantial homology to an *Alloiococcus otitidis* polypeptide.

Biological equivalents or variants of *Alloiococcus otitidis* include both functional and non-functional *Alloiococcus otitidis* polypeptides. Functional biological equivalents or variants are naturally occurring amino acid sequence variants of an *Alloiococcus otitidis* polypeptide that maintain the ability to elicit an immunological or antigenic response in a subject. Functional variants will typically contain only conservative substitutions of one or more amino acids in one of the even numbered sequences set forth in SEQ ID NO: 2 through SEQ ID NO: 6650 or substitution, deletion or insertion of non-critical residues in non-critical regions of the polypeptide (e.g., not in regions containing antigenic determinants or protective epitopes).

The present invention further provides non-*Alloiococcus otitidis* orthologs of *Alloiococcus otitidis* polypeptides. Orthologs of *Alloiococcus otitidis* polypeptides are polypeptides that are isolated from non-*Alloiococcus otitidis* organisms and possess antigenic capabilities of the *Alloiococcus otitidis* polypeptide. Orthologs of an *Alloiococcus otitidis* polypeptide can readily be identified as comprising an amino acid sequence that is substantially homologous to one of the even numbered sequences set forth in set forth in SEQ ID NO: 2 through SEQ ID NO: 6650.

Modifications and changes can be made in the structure of a polypeptide of the present invention and still obtain a molecule having *Alloiococcus otitidis* antigenicity. For example, certain amino acids can be substituted for other amino acids in a sequence

without appreciable loss of antigenicity. Because it is the interactive capacity and nature of a polypeptide that defines that polypeptide's biological functional activity, certain amino acid sequence substitutions can be made in a polypeptide sequence (or, of course, its underlying DNA coding sequence) and nevertheless obtain a polypeptide with like properties.

In making such changes, the hydropathic index of amino acids can be considered. The importance of the hydropathic amino acid index in conferring interactive biologic function on a polypeptide is generally understood in the art (Kyte & Doolittle, 1982). It is known that certain amino acids can be substituted for other amino acids having a similar hydropathic index or score and still result in a polypeptide with similar biological activity. Each amino acid has been assigned a hydropathic index on the basis of its hydrophobicity and charge characteristics. Those indices are: isoleucine (+4.5); valine (+4.2); leucine (+3.8); phenylalanine (+2.8); cysteine/cystine (+2.5); methionine (+1.9); alanine (+1.8); glycine (-0.4); threonine (-0.7); serine (-0.8); tryptophan (-0.9); tyrosine (-1.3); proline (-1.6); histidine (-3.2); glutamate (-3.5); glutamine (-3.5); aspartate (-3.5); asparagine (-3.5); lysine (-3.9); and arginine (-4.5).

It is believed that the relative hydropathic character of the amino acid residue determines the secondary and tertiary structure of the resultant polypeptide, which in turn defines the interaction of the polypeptide with other molecules, such as enzymes, substrates, receptors, antibodies, antigens, and the like. It is known in the art that an amino acid can be substituted by another amino acid having a similar hydropathic index and still obtain a functionally equivalent polypeptide. In such changes, the substitution of amino acids whose hydropathic indices are within +/-2 is preferred, those within +/-1 are particularly preferred, and those within +/-0.5 are even more particularly preferred.

Substitution of like amino acids can also be made on the basis of hydrophilicity, particularly where the biologically functional equivalent polypeptide or peptide thereby created is intended for use in immunological embodiments. U.S. Pat. No. 4,554,101, incorporated herein by reference, states that the greatest local average hydrophilicity of a polypeptide, as governed by the hydrophilicity of its adjacent amino acids, correlates with its immunogenicity and antigenicity, *i.e.* with a biological property of the polypeptide.

As detailed in U.S. Pat. No. 4,554,101, the following hydrophilicity values have been assigned to amino acid residues: arginine (+3.0); lysine (+3.0); aspartate (+3.0 ±1); glutamate (+3.0 ±1); serine (+0.3); asparagine (+0.2); glutamine (+0.2); glycine (0);

proline (-0.5 ±1); threonine (-0.4); alanine (-0.5); histidine (-0.5); cysteine (-1.0); methionine (-1.3); valine (-1.5); leucine (-1.8); isoleucine (-1.8); tyrosine (-2.3); phenylalanine (-2.5); tryptophan (-3.4). It is understood that an amino acid can be substituted for another having a similar hydrophilicity value and still obtain a biologically equivalent, and in particular, an immunologically equivalent polypeptide. In such changes, the substitution of amino acids whose hydrophilicity values are within ±2 is preferred, those that are within ±1 are particularly preferred, and those within ±0.5 are even more particularly preferred.

As outlined above, amino acid substitutions are generally therefore based on the relative similarity of the amino acid side-chain substituents, for example, their hydrophobicity, hydrophilicity, charge, size, and the like. Exemplary substitutions which take various of the foregoing characteristics into consideration are well known to those of skill in the art and include: arginine and lysine; glutamate and aspartate; serine and threonine; glutamine and asparagine; and valine, leucine and isoleucine (*see* Table 23, below). The present invention thus contemplates functional or biological equivalents of an *Alloiococcus otitidis* polypeptide as set forth above.

TABLE 23

AMINO ACID SUBSTITUTIONS

Original Residue	Exemplary Residue Substitution
Ala	Gly; Ser
Arg	Lys
Asn	Gln; His
Asp	Glu
Cys	Ser
Gln	Asn

TABLE 23

AMINO ACID SUBSTITUTIONS

Original Residue	Exemplary Residue Substitution
Glu	Asp
Gly	Ala
His	Asn; Gln
Ile	Leu; Val
Leu	Ile; Val
Lys	Arg
Met	Met; Leu; Tyr
Ser	Thr
Thr	Ser
Trp	Tyr
Tyr	Trp; Phe
Val	Ile; Leu

Biological or functional equivalents of a polypeptide are also prepared using site-specific mutagenesis. Site-specific mutagenesis is a technique useful in the preparation of second generation polypeptides, or biologically functional equivalent polypeptides or peptides, derived from the sequences thereof, through specific mutagenesis of the underlying DNA. As noted above, such changes can be desirable where amino acid substitutions are desirable. The technique further provides a capacity to prepare and test sequence variants, for example, incorporating one or more of the foregoing considerations, by introducing one or more nucleotide sequence changes into the DNA. Site-specific mutagenesis allows the production of mutants through the use of specific oligonucleotide sequences which encode the DNA sequence of the desired mutation, as well as a sufficient number of adjacent nucleotides, to provide a primer sequence of sufficient size and sequence complexity to form a stable duplex on both sides of the deletion junction being traversed. Typically, a primer of about 17 to 25 nucleotides in length is preferred, with about 5 to 10 residues on both sides of the site of the alteration of the sequence.

In general, the technique of site-specific mutagenesis is well known in the art. As will be appreciated, the technique typically employs a phage vector that can exist in both a single stranded and double stranded form. Typically, site-directed mutagenesis in accordance herewith is performed by first obtaining a single-stranded vector which includes within its sequence a DNA sequence which encodes all or a portion of the *Alloiococcus otitidis* polypeptide sequence selected. An oligonucleotide primer bearing the desired mutated sequence is prepared (*e.g.*, synthetically). This primer is then annealed to the singled-stranded vector, and extended by the use of enzymes such as *Escherichia coli* polymerase I Klenow fragment, in order to complete the synthesis of the mutation-bearing strand. Thus, a heteroduplex is formed wherein one strand encodes the original non-mutated sequence and the second strand bears the desired mutation. This heteroduplex vector is then used to transform appropriate cells such as *Escherichia coli* cells and clones are selected which include recombinant vectors bearing the mutation. Commercially available kits come with all the reagents necessary, except the oligonucleotide primers.

An *Alloiococcus otitidis* polypeptide or polypeptide antigen of the present invention is understood to mean any *Alloiococcus otitidis* polypeptide comprising substantial sequence similarity, structural similarity and/or functional similarity to an *Alloiococcus otitidis* polypeptide comprising the amino acid sequence of one of the even numbered sequences set forth in SEQ ID NO: 2 through SEQ ID NO: 6650. In addition, an *Alloiococcus otitidis* polypeptide or polypeptide antigen of the invention is not limited to a particular source. Thus, the invention provides for the general detection and isolation of the polypeptides from a variety of sources.

It is contemplated in the present invention, that an *Alloiococcus otitidis* polypeptide may advantageously be cleaved into fragments for use in further structural or functional analysis, or in the generation of reagents such as *Alloiococcus otitidis*-related polypeptides and *Alloiococcus otitidis*-specific antibodies. This can be accomplished by treating purified or unpurified *Alloiococcus otitidis* polypeptides with a peptidase such as endoproteinase glu-C (Roche Diagnostics Corporation, Indianapolis, IN). Treatment with CNBr is another method by which peptide fragments may be produced from natural *Alloiococcus otitidis* polypeptides. Recombinant techniques also can be used to produce specific fragments of an *Alloiococcus otitidis* polypeptide.

In addition, the Applicants also contemplate that compounds sterically similar to a particular *Alloiococcus otitidis* polypeptide antigen, called peptidomimetics, may be formulated to mimic the key portions of the peptide structure. Peptidemimetics are peptide-containing molecules that mimic elements of protein secondary structure. (*See*, for example, Johnson *et al.*, 1993.) The underlying rationale behind the use of peptide mimetics is that the peptide backbone of proteins exists chiefly to orient amino acid side chains in such a way as to facilitate molecular interactions, such as those of receptor and ligand.

Successful applications of the peptide mimetic concept have thus far focused on mimetics of β-turns within proteins. Likely β-turn structures within *Alloiococcus otitidis* proteins can be predicted by computer-based algorithms as discussed above. Once the component amino acids of the turn are determined, mimetics can be constructed to achieve a similar spatial orientation of the essential elements of the amino acid side chains, as discussed in Johnson *et al.*, 1993.

Fragments of the Alloiococcus otitidis polypeptides are also included in the invention. A fragment is a polypeptide having an amino acid sequence that entirely is the same as a part, but not all, of the amino acid sequence. The fragment can comprise, for example, at least 7 or more (e.g., 8, 10 12, 14, 16, 18, 20 or more) contiguous amino acids of an one of amino acid sequence selected from one of the even numbered sequences set forth in SEQ ID NO.: 2 through SEQ ID NO.: 6650. Fragments may be "freestanding" or comprised within a larger polypeptide of which they form a part or region, most preferably as a single, continuous region. In one embodiment, the fragments include at least one epitope of the mature polypeptide sequence.

"Fusion protein" refers to a protein encoded by two, often unrelated, fused genes or fragments thereof. For example, fusion proteins comprising various portions of constant region of immunoglobulin molecules together with another human protein or part thereof have been described. In many cases, employing an immunoglobulin Fc region as a part of a fusion protein is advantageous for use in therapy and diagnosis resulting in, for example, improved pharmacokinetic properties (*see, e.g.*, EP-A 0232 2621). On the other hand, for some uses it would be desirable to be able to delete the Fc part after the fusion protein has been expressed, detected and purified.

D. *Alloiococcus otitidis* Polynucleotide and Polypeptide Variants

"Variant" as the term is used herein, is a polynucleotide or polypeptide that differs from a reference polynucleotide or polypeptide respectively, but retains essential properties. A typical variant of a polynucleotide differs in nucleotide sequence from another, reference polynucleotide. Changes in the nucleotide sequence of the variant may or may not alter the amino acid sequence of a polypeptide encoded by the reference polynucleotide. Nucleotide changes may result in amino acid substitutions, additions, deletions, fusions and truncations in the polypeptide encoded by the reference sequence, as discussed below. A typical variant of a polypeptide differs in amino acid sequence from another, reference polypeptide. Generally, differences are limited so that the sequences of the reference polypeptide and the variant are closely similar overall and, in many regions, identical. A variant and reference polypeptide may differ in amino acid sequence by one or more substitutions, additions and deletions in any combination. A substituted or inserted amino acid residue may or may not be one encoded by the genetic code. A variant of a polynucleotide or polypeptide may be a naturally occurring such as an allelic variant, or it may be a variant that is not known to occur naturally. Non-naturally occurring variants of polynucleotides and polypeptides may be made by mutagenesis techniques or by direct synthesis.

"Identity," as known in the art, is a relationship between two or more polypeptide sequences or two or more polynucleotide sequences, as determined by comparing the sequences. In the art, "identity" also means the degree of sequence relatedness between polypeptide or polynucleotide sequences, as the case may be, as determined by the match between strings of such sequences. "Identity" can be readily calculated by known methods, including but not limited to those described in (Computational Molecular Biology, Lesk, A. M., ed., Oxford University Press, New York, 1988; Biocomputing: Informatics and Genome Projects, Smith, D. W., ed., Academic Press, New York, 1993; Computer Analysis of Sequence Data, Part I, Griffin, A. M., and Griffin, H. G., eds., Humana Press, New Jersey, 1994; Sequence Analysis in Molecular Biology, von Heinje, G., Academic Press, 1987; and Sequence Analysis Primer, Gribskov, M. and Devereux, J., eds., M Stockton Press, New York, 1991; and Carillo, H., and Lipman, D., SIAM J. Applied Math., 48: 1073 (1988). Preferred methods to determine identity are designed to give the largest match between the sequences tested. Methods to determine identity are codified in publicly available computer programs. Preferred computer program methods

to determine identity between two sequences include, but are not limited to, the GCG program package (Devereux, J., *et al* 1984), BLASTP, BLASTN, and FASTA (Altschul, S. F., *et al.*, 1990. The BLASTX program is publicly available from NCBI and other sources (BLAST Manual, Altschul, S., *et al.*, NCBI NLM NIH Bethesda, Md. 20894; Altschul, S., *et al.*, 1990). The well-known Smith-Waterman algorithm may also be used to determine identity. (Smith, T.L. and Waterman, M.S., 1981).

By way of example, a polynucleotide sequence of the present invention may be identical to the reference sequence of one of the odd numbered sequences set forth in SEQ ID NO:1 through SEQ ID NO: 6649, that is be 100% identical, or it may include up to a certain integer number of nucleotide alterations as compared to the reference sequence. Such alterations are selected from the group consisting of at least one nucleotide deletion, substitution, including transition and transversion, or insertion, and wherein said alterations may occur at the 5' or 3' terminal positions of the reference nucleotide sequence or anywhere between those terminal positions, interspersed either individually among the nucleotides in the reference sequence or in one or more contiguous groups within the reference sequence. The number of nucleotide alterations is determined by multiplying the total number of nucleotides in one of the odd numbered sequences set forth in SEQ ID NO: 1 through SEQ ID NO: 6649 by the numerical percent of the respective percent identity (divided by 100) and subtracting that product from said total number of nucleotides in one of the odd numbered sequences set forth in SEQ ID NO: 1 through SEQ ID NO: 6649.

For example, the alterations in an isolated *Alloiococcus otitidis* polynucleotide comprising a polynucleotide sequence that has at least 70% identity to the nucleic acid sequence of one of the odd numbered sequences set forth in SEQ ID NO: 1 through SEQ ID NO: 6649; a degenerate variant thereof or a fragment thereof, wherein the polynucleotide sequence may include up to n_n nucleic acid alterations over the entire polynucleotide region of the nucleic acid sequence of one of the odd numbered sequences set forth in SEQ ID NO: 1 through SEQ ID NO: 6649, wherein n_n is the maximum number of alterations and is calculated by the formula:

$$n_n \leq x_n-(x_n \bullet y),$$

in which x_n is the total number of nucleic acids of one of the odd numbered sequences set forth in SEQ ID NO:1 through SEQ ID NO:6649 and y has a value of 0.70, wherein any non-integer product of x_n and y is rounded down to the nearest integer prior to

subtracting such product from x_n. Furthermore, y may also have a value of 0.80 for 80%, 0.85 for 85%, 0.90 for 90% 0.95 for 95%, *etc.*

Similarly, a polypeptide sequence of the present invention may be identical to the reference sequence of one of the even numbered sequences set forth in SEQ ID NO: 2 through SEQ ID NO: 6650, that is 100% identical, or it may include up to a certain integer number of amino acid alterations as compared to the reference sequence such that the percentage identity is less than 100%. Such alterations are selected from the group consisting of at least one amino acid deletion, substitution, including conservative and non-conservative substitution, or insertion, and wherein said alterations may occur at the amino- or carboxy-terminal positions of the reference polypeptide sequence or anywhere between those terminal positions, interspersed either individually among the amino acids in the reference sequence or in one or more contiguous groups within the reference sequence. The number of amino acid alterations for a given % identity is determined by multiplying the total number of amino acids in one of the even numbered sequences set forth in SEQ ID NO: 2 through SEQ ID NO: 6650 by the numerical percent of the respective percent identity (divided by 100) and then subtracting that product from said total number of amino acids in one of the even numbered sequences set forth in SEQ ID NO: 2 through SEQ ID NO: 6650, or:

$$n_a \leq x_a-(x_a \cdot y),$$

wherein n_a is the number of amino acid alterations, x_a is the total number of amino acids in one of the even numbered sequences set forth in SEQ ID NO: 2 through SEQ ID NO: 6650, and y is, for instance 0.70 for 70%, 0.80 for 80%, 0.85 for 85% etc., and wherein any non-integer product of x_a and y is rounded down to the nearest integer prior to subtracting it from x_a.

E. VECTORS, HOST CELLS AND RECOMBINANT *ALLOIOCOCCUS OTITIDIS* POLYPEPTIDES

In a preferred embodiment, the present invention provides expression vectors comprising ORF polynucleotides that encode *Alloiococcus otitidis* polypeptides. Preferably, the expression vectors of the present invention comprise ORF polynucleotides that encode *Alloiococcus otitidis* polypeptides comprising the amino acid residue sequence of one of the even numbered sequences set forth in SEQ ID NO: 2 through SEQ ID NO: 6650. More preferably, the expression vectors of the present invention comprise a polynucleotide comprising the nucleotide base sequence of one of

the odd numbered sequences set forth in SEQ ID NO: 1 through SEQ ID NO: 6649. Even more preferably, the expression vectors of the invention comprise a polynucleotide operatively linked to a promoter. Still more preferably, the expression vectors of the invention comprise a polynucleotide operatively linked to a prokaryotic promoter. Alternatively, the expression vectors of the present invention comprise a polynucleotide operatively linked to an enhancer-promoter, that is, an eukaryotic promoter. The expression vectors further comprise a polyadenylation signal that is positioned 3' of the codon encoding the carboxy-terminal amino acid and within a transcriptional unit of the encoded polypeptide.

Expression of proteins in prokaryotes is most often carried out in *Escherichia coli* with vectors containing constitutive or inducible promoters directing the expression of either fusion or non-fusion proteins. Fusion vectors add a number of amino acids to a protein encoded therein, usually to the amino terminus of the recombinant protein. Such fusion vectors typically serve three purposes: 1) to increase expression of recombinant protein; 2) to increase the solubility of the recombinant protein; and 3) to aid in the purification of the recombinant protein by acting as a ligand in affinity purification. Often, in fusion expression vectors, a proteolytic cleavage site is introduced at the junction of the fusion moiety and the recombinant protein to enable separation of the recombinant protein from the fusion moiety subsequent to purification of the fusion protein. Such enzymes, and their cognate recognition sequences, include Factor Xa, thrombin and enterokinase.

Typical fusion expression vectors include pGEX (Pharmacia Biotech Inc;), pMAL (New England Biolabs, Beverly; MA) and pRIT5 (Pharmacia, Piscataway, NJ) which fuse glutathione S- transferase (GST), maltose E binding protein, or protein A, respectively, to the target recombinant protein.

In one embodiment, the coding sequence of the *Alloiococcus otitidis* polynucleotide is cloned into a pGEX expression vector to create a vector encoding a fusion protein comprising, from the N-terminus to the C-terminus, GST-thrombin cleavage site-*Alloiococcus otitidis* polypeptide. The fusion protein is purified by affinity chromatography using glutathione-agarose resin. Recombinant *Alloiococcus otitidis* polypeptide unfused to GST is recovered by cleavage of the fusion protein with thrombin.

Examples of suitable inducible non-fusion *Escherichia coli* expression vectors include pTrc (Amann *et al.*, 1988) and pET 1 1 d (Studier *et al.*, 1990). Target gene

expression from the pTrc vector relies on host RNA polymerase transcription from a hybrid trp-lac fusion promoter. Target gene expression from the pET II vector relies on transcription from a T7 gene1 lac fusion promoter mediated by a coexpressed viral RNA polymerase T7 genel. This viral polymerase is supplied by host strains BL21 (DE3) or HMS I 74(DE3) from a resident prophage harboring a T7 gene1 gene under the transcriptional control of the lacUV 5 promoter.

One strategy to maximize recombinant protein expression in *Escherichia coli* is to express the protein in a host bacterium with an impaired capacity to proteolytically cleave the recombinant protein. Another strategy is to alter the nucleic acid sequence of the nucleic acid to be inserted into an expression vector so that the individual codons for each amino acid are those preferentially utilized in *Escherichia coli*. Such alteration of nucleic acid sequences of the invention can be carried out by standard DNA mutagenesis or synthesis techniques.

In another embodiment, the *Alloiococcus otitidis* polynucleotide expression vector is a yeast expression vector. Examples of vectors for expression in a yeast such as *S. cerevisiae* include pYepSec I (Baldari, *et al.*, 1987), pMFa (Kurjan and Herskowitz, 1982), pJRY88 (Schultz *et al.*, 1987), and pYES2 (Invitrogen Corporation, San Diego, CA).

Alternatively, an *Alloiococcus otitidis* polynucleotide is expressed in insect cells using, for example, baculovirus expression vectors. Baculovirus vectors available for expression of proteins in cultured insect cells (*e.g.*, Sf 9 or Sf 21 cells) include the pAc series (Smith *et al.*, 1983) and the pVL series (Lucklow and Summers, 1989).

In yet another embodiment, a nucleic acid of the invention is expressed in mammalian cells using a mammalian expression vector. Examples of mammalian expression vectors include pCDM8 (Seed, 1987) and pMT2PC (Kaufman *et al.*, 1987). When used in mammalian cells, the expression vector's control functions are often provided by viral regulatory elements.

For example, commonly used promoters are derived from polyoma, Adenovirus 2, cytomegalovirus (CMV) and Simian Virus 40 (SV40). For other suitable expression systems for both prokaryotic and eukaryotic cells see chapters 16 and 17 of Sambrook *et al.*, "Molecular Cloning: A Laboratory Manual" 2nd, ed, Cold Spring Harbor Laboratory, Cold Spring Harbor Laboratory Press, Cold Spring Harbor, NY, 1989, incorporated herein by reference.

In another embodiment, the recombinant mammalian expression vector is capable of directing expression of the nucleic acid preferentially in a particular cell type (*e.g.*, tissue-specific regulatory elements are used to express the nucleic acid). Tissue-specific regulatory elements are known in the art. Non-limiting examples of suitable tissue-specific promoters include the albumin promoter (liver-specific; Pinkert *et al.*, 1987), lymphoid-specific promoters (Calame and Eaton, 1988), in particular promoters of T cell receptors (Winoto and Baltimore, 1989) and immunoglobulins (Banerji *et al.*, (1983); and Queen and Baltimore (1983)), neuron-specific promoters (*e.g.*, the neurofilament promoter; Byrne and Ruddle, 1989), pancreas-specific promoters (Edlund *et al.*, 1985), and mammary gland-specific promoters (*e.g.*, milk whey promoter; U.S. 4, 873,316 and EP 264,166). Developmentally-regulated promoters are also encompassed, for example the murine hox promoters (Kessel and Gruss, 1990) and the α-fetoprotein promoter (Campes and Tilghman, 1989).

The invention further provides a recombinant expression vector comprising a DNA molecule encoding an *Alloiococcus otitidis* polypeptide cloned into the expression vector in an antisense orientation. That is, the DNA molecule is operatively linked to a regulatory sequence in a manner which allows for expression (by transcription of the DNA molecule) of an RNA molecule which is antisense to *Alloiococcus otitidis* mRNA. Regulatory sequences operatively linked to a nucleic acid cloned in the antisense orientation can be chosen which direct the continuous expression of the antisense RNA molecule in a variety of cell types, for instance viral promoters and/or enhancers, or regulatory sequences can be chosen which direct constitutive, tissue specific or cell type specific expression of antisense RNA. The antisense expression vector can be in the form of a recombinant plasmid, phagemid or attenuated virus in which antisense nucleic acids are produced under the control of a high efficiency regulatory region, the activity of which can be determined by the cell type into which the vector is introduced.

Another aspect of the invention pertains to host cells into which a recombinant expression vector of the invention has been introduced. The terms "host cell" and "recombinant host cell" are used interchangeably herein. It is understood that such terms refer not only to the particular subject cell but also to the progeny or potential progeny of such a cell. Because certain modifications may occur in succeeding generations due to either mutation or environmental influences, such progeny may not, in fact, be identical to the parent cell, but are still included within the scope of the term as

used herein. A host cell can be any prokaryotic or eukaryotic cell. For example, an *Alloiococcus otitidis* polypeptide can be expressed in bacterial cells such as *Escherichia coli*, insect cells, yeast or mammalian cells (such as Chinese hamster ovary cells (CHO), NIH3T3, PER C6, NSO or COS cells). Other suitable host cells are known to those skilled in the art.

Vector DNA can be introduced into prokaryotic or eukaryotic cells *via* conventional transformation, infection or transfection techniques. As used herein, the terms "transformation" and "transfection" are intended to refer to a variety of art-recognized techniques for introducing foreign nucleic acid (*e.g.*, DNA) into a host cell, including calcium phosphate or calcium chloride co-precipitation, DEAE-dextran-mediated transfection, lipofection, protoplast fusion, direct microinfection. Another recognized technique for introducing DNA into a host cell is "infection", such as by adenovirus infection or electroporation. Suitable methods for transforming, infecting or transfecting host cells can be found in Sambrook, *et al.* ("Molecular Cloning: A Laboratory Manual" 2nd ed, Cold Spring Harbor Laboratory, Cold Spring Harbor Laboratory Press, Cold Spring Harbor, NY, 1989), and other laboratory manuals.

The most widely used method is transfection mediated by either calcium phosphate or DEAE-dextran. Although the mechanism remains unclear, it is believed that the transfected DNA enters the cytoplasm of the cell by endocytosis and is transported to the nucleus. Depending on the cell type, up to 90% of a population of cultured cells can be transfected at any one time. Because of its high efficiency, transfection mediated by calcium phosphate or DEAE-dextran is the method of choice for experiments that require transient expression of the foreign DNA in large numbers of cells. Calcium phosphate-mediated transfection is also used to establish cell lines that integrate copies of the foreign DNA, which are usually arranged in head-to-tail tandem arrays into the host cell genome.

In the protoplast fusion method, protoplasts derived from bacteria carrying high numbers of copies of plasmid of interest are mixed directly with cultured mammalian cells. After fusion of the cell membranes (usually with polyethylene glycol), the contents of the bacteria are delivered into the cytoplasm of the mammalian cells and the plasmid DNA is transported to the nucleus. Protoplast fusion is not as efficient as transfection for many of the cell lines that are commonly used for transient expression assays, but it is useful for cell lines in which endocytosis of DNA occurs inefficiently. Protoplast fusion

frequently yields multiple copies of the plasmid DNA tandemly integrated into the host chormosome.

The application of brief, high-voltage electric pulses (electroporation) to a variety of mammalian and plant cells leads to the formation of nanometer-sized pores in the plasma membrane. DNA is taken directly into the cell cytoplasm either through these pores or as a consequence of the redistribution of membrane components that accompanies closure of the pores. Electroporation can be extremely efficient and can be used both for transient expression of cloned genes and for establishment of cell lines that carry integrated copies of the gene of interest. Electroporation, in contrast to calcium phosphate-mediated transfection and protoplast fusion, frequently gives rise to cell lines that carry one, or at most a few, integrated copies of the foreign DNA.

Liposome transfection involves encapsulation of DNA and RNA within liposomes, followed by fusion of the liposomes with the cell membrane. The mechanism of how DNA is delivered into the cell is unclear, but transfection efficiencies can be as high as 90%.

Direct microinjection of a DNA molecule into nuclei has the advantage of not exposing DNA to cellular compartments such as low-pH endosomes. Microinjection therefore used primarily as a method to establish lines of cells that carry integrated copies of the DNA of interest.

The use of adenovirus as a vector for cell transfection is well known in the art. Adenovirus vector-mediated cell transfection has been reported for various cells (Stratford-Perricaudet, *et al.* 1992).

A host cell of the invention, such as a prokaryotic or eukaryotic host cell in culture, is used to produce (*i.e.*, express) one or more *Alloiococcus otitidis* polypeptides. Accordingly, the invention further provides methods for producing an *Alloiococcus otitidis* polypeptide using the host cells of the invention. In one embodiment, the method comprises culturing the host cell of invention (into which a recombinant expression vector encoding an *Alloiococcus otitidis* polypeptide has been introduced) in a suitable medium until the *Alloiococcus otitidis* polypeptide is produced. In another embodiment, the method further comprises isolating the *Alloiococcus otitidis* polypeptide from the medium or the host cell.

As used herein, a promoter is a region of a DNA molecule typically within about 100 nucleotide pairs in front of (upstream of) the point at which transcription begins (*i.e.*,

a transcription start site). That region typically contains several types of DNA sequence elements that are located in similar relative positions in different genes. As used herein, the term "promoter" includes what is referred to in the art as an upstream promoter region, a promoter region or a promoter of a generalized eukaryotic RNA Polymerase II transcription unit.

Another type of discrete transcription regulatory sequence element is an enhancer. An enhancer provides specificity of time, location and expression level for a particular encoding region (*e.g.*, gene). A major function of an enhancer is to increase the level of transcription of a coding sequence in a cell that contains one or more transcription factors that bind to that enhancer. Unlike a promoter, an enhancer can function when located at variable distances from transcription start sites so long as a promoter is present.

As used herein, the phrase "enhancer-promoter" means a composite unit that contains both enhancer and promoter elements. An enhancer-promoter is operatively linked to a coding sequence that encodes at least one gene product. As used herein, the phrase "operatively linked" means that an enhancer-promoter is connected to a coding sequence in such a way that the transcription of that coding sequence is controlled and regulated by that enhancer-promoter. Means for operatively linking an enhancer-promoter to a coding sequence are well known in the art. As is also well known in the art, the precise orientation and location relative to a coding sequence whose transcription is controlled, is dependent *inter alia* upon the specific nature of the enhancer-promoter. Thus, a TATA box minimal promoter is typically located from about 25 to about 30 base pairs upstream of a transcription initiation site and an upstream promoter element is typically located from about 100 to about 200 base pairs upstream of a transcription initiation site. In contrast, an enhancer can be located downstream from the initiation site and can be at a considerable distance from that site.

An enhancer-promoter used in a vector construct of the present invention can be any enhancer-promoter that drives expression in a cell to be transfected. By employing an enhancer-promoter with well-known properties, the level and pattern of gene product expression can be optimized.

A coding sequence of an expression vector is operatively linked to a transcription termination region. RNA polymerase transcribes an encoding DNA sequence through a site where polyadenylation occurs. Typically, DNA sequences located a few hundred

base pairs downstream of the polyadenylation site serve to terminate transcription. Those DNA sequences are referred to herein as transcription-termination regions. Those regions are required for efficient polyadenylation of transcribed messenger RNA (mRNA). Transcription-terminating regions are well known in the art. A preferred transcription-terminating region used in a vector construct of the present invention comprises a polyadenylation signal of SV40 or the protamine gene. The bGH polyadenylation signal is also suitable for use.

An expression vector comprises a polynucleotide that encodes an *Alloiococcus otitidis* polypeptide. Such a polypeptide is meant to include a sequence of nucleotide bases encoding an *Alloiococcus otitidis* polypeptide sufficient in length to distinguish the segment from a polynucleotide segment encoding a non-*Alloiococcus otitidis* polypeptide. A polypeptide of the invention can also encode biologically functional polypeptides or peptides, which have variant amino acid sequences, such as with changes selected, based on considerations such as the relative hydropathic score of the amino acids being exchanged. These variant sequences are those isolated from natural sources or induced in the sequences disclosed herein using a mutagenic procedure such as site-directed mutagenesis.

Preferably, an expression vector of the present invention comprises a polynucleotide that encodes a polypeptide comprising the amino acid residue sequence of one of even numbered sequences set forth in SEQ ID NO: 2 through SEQ ID NO:.6650 An expression vector can include an *Alloiococcus otitidis* polypeptide coding region itself of any of the *Alloiococcus otitidis* polypeptides noted above or it can contain coding regions bearing selected alterations or modifications in the basic coding region of such an *Alloiococcus otitidis* polypeptide. Alternatively, such vectors or fragments can encode larger polypeptides or polypeptides which nevertheless include the basic coding region. In any event, it should be appreciated that due to codon redundancy as well as biological functional equivalence, this aspect of the invention is not limited to the particular DNA molecules corresponding to the polypeptide sequences noted above.

Exemplary vectors include the mammalian expression vectors of the pCMV family including pCMV6b and pCMV6c (Chiron Corp., Emeryville CA.). In certain cases, and specifically in the case of these individual mammalian expression vectors, the resulting constructs can require co-transfection with a vector containing a selectable marker such as pSV2neo. *Via* co-transfection into a dihydrofolate reductase-deficient Chinese

hamster ovary cell line, such as DG44, clones expressing *Alloiococcus otitidis* polypeptides by virtue of DNA incorporated into such expression vectors can be detected.

A DNA molecule of the present invention can be incorporated into a vector by a number of techniques that are well known in the art. For instance, the vector pUC18 has been demonstrated to be of particular value in cloning and expression of genes. Likewise, the related vectors M13mp18 and M13mp19 can also be used in certain embodiments of the invention, in particular, in performing dideoxy sequencing.

An expression vector of the present invention is useful both as a means for preparing quantities of the *Alloiococcus otitidis* polypeptide-encoding DNA itself, and as a means for preparing the encoded polypeptide and peptides. It is contemplated that where *Alloiococcus otitidis* polypeptides of the invention are made by recombinant means, one can employ either prokaryotic or eukaryotic expression vectors as shuttle systems. In another aspect, the recombinant host cells of the present invention are prokaryotic host cells. Preferably, the recombinant host cells of the invention are bacterial cells of the DH5α strain of *Escherichia coli*. In general, prokaryotes are preferred for the initial cloning of DNA sequences and constructing the vectors useful in the invention. For example, *Escherichia coli* K12 strains can be particularly useful. Other microbial strains that can be used include *Escherichia coli* B, *Escherichia coli* W3110 (ATCC No. 273325) and *Escherichia. coli*$_{\chi}$1976 (ATCC No. 31537). *Bacilli* such as *Bacillus subtilis,* or other enterobacteriaceae such as *Salmonella typhimurium* or *Serratia marcesans,* and various Pseudomonas species can be used. These examples are, of course, intended to be illustrative rather than limiting.

In general, plasmid vectors containing replicon and control sequences that are derived from species compatible with the host cell are used in connection with these hosts. The vector ordinarily carries a replication site, as well as marking sequences that are capable of providing phenotypic selection in transformed cells. For example, *Escherichia coli* is transformed using pBR322, a plasmid derived from an *Escherichia coli* species (Bolivar, *et al.* 1977). pBR322 contains genes for ampicillin and tetracycline resistance and thus provides an easy means for identifying transformed cells. The pBR322 plasmid, or other microbial plasmid or phage, must also contain, or be modified to contain, promoters, which can be used by the microbial organism for expression of its own polypeptides.

Those promoters most commonly used in recombinant DNA construction include the β-lactamase (penicillinase) and lactose promoter systems (Chang, *et al.* 1978; Itakura, *et al.* 1977, Goeddel, *et al.* 1979; Goeddel, *et al.* 1980) and a tryptophan (TRP) promoter system (EP 0036776; Siebwenlist *et al.* 1980). While these are the most commonly used, other microbial promoters have been discovered and utilized, and details concerning their nucleotide sequences have been published, enabling a skilled worker to introduce functional promoters into plasmid vectors (Siebwenlist, *et al.* 1980).

In addition to prokaryotes, eukaryotic microbes such as yeast can also be used. *Saccharomyces cerevisiase* or common baker's yeast is the most commonly used among eukaryotic microorganisms, although a number of other strains are commonly available. For expression in Saccharomyces, the plasmid YRp7, for example, is commonly used (Stinchcomb, *et al.* 1979; Kingsman, *et al.* 1979; Tschemper, *et al.* 1980). This plasmid already contains the trpl gene that provides a selection marker for a mutant strain of yeast lacking the ability to grow in tryptophan, for example ATCC No. 44076 or PEP4-1 (Jones, 1977). The presence of the trpl lesion as a characteristic of the yeast host cell genome then provides an effective environment for detecting transformation by growth in the absence of tryptophan.

Suitable promoter sequences in yeast vectors include the promoters for 3-phosphoglycerate kinase (PGK) (Hitzeman, *et al.* 1980) or other glycolytic enzymes such as enolase, glyceraldehyde-3-phosphate dehydrogenase, hexokinase, pyruvate decarboxylase, phosphofructokinase, glucose-6-phosphate isomerase, 3-phosphoglycerate mutase, pyruvate kinase, triosephosphate isomerase, phosphoglucose isomerase, and glucokinase. In constructing suitable expression plasmids, the termination sequences associated with these genes are also introduced into the expression vector downstream from the sequences to be expressed to provide polyadenylation of the mRNA and termination. Other promoters, which have the additional advantage of transcription controlled by growth conditions are the promoter region for alcohol dehydrogenase 2, isocytochrome C, acid phosphatase, degradative enzymes associated with nitrogen metabolism, and the aforementioned glyceraldehyde-3-phosphate dehydrogenase, and enzymes responsible for maltose and galactose utilization. Any plasmid vector containing a yeast-compatible promoter, origin of replication, and termination sequences is suitable.

In addition to microorganisms, cultures of cells derived from multicellular organisms can also be used as hosts. In principle, any such cell culture is workable, whether from vertebrate or invertebrate culture. However, interest has been greatest in vertebrate cells, and propagation of vertebrate cells in culture (tissue culture) has become a routine procedure in recent years. Examples of such useful host cell lines are AtT-20, VERO, HeLa, NSO, PER C6, Chinese hamster ovary (CHO) cell lines, W138, BHK, COSM6, COS-7, 293 and MDCK cell lines. Expression vectors for such cells ordinarily include (if necessary) an origin of replication, a promoter located upstream of the gene to be expressed, along with any necessary ribosome binding sites, RNA splice sites, polyadenylation site, and transcriptional terminator sequences.

Where expression of recombinant *Alloiococcus otitidis* polypeptides is desired and a eukaryotic host is contemplated, it is most desirable to employ a vector, such as a plasmid, that incorporates a eukaryotic origin of replication. Additionally, for the purposes of expression in eukaryotic systems, one desires to position the *Alloiococcus otitidis* encoding sequence adjacent to and under the control of an effective eukaryotic promoter such as promoters used in combination with Chinese hamster ovary cells (CHO). To bring a coding sequence under control of a promoter, whether it is eukaryotic or prokaryotic, what is generally needed is to position the 5' end of the translation initiation site of the proper translational reading frame of the polypeptide between about 1 and about 50 nucleotides 3' of (downstream) the promoter chosen. Furthermore, where eukaryotic expression is anticipated, one would typically desire to incorporate an appropriate polyadenylation site into the transcriptional unit that includes the *Alloiococcus otitidis* polypeptide.

A transfected cell can be prokaryotic or eukaryotic. Preferably, the host cells of the invention are prokaryotic host cells. Where it is of interest to produce an *Alloiococcus otitidis* polypeptide, cultured prokaryotic host cells are of particular interest.

In yet another embodiment, the present invention contemplates a process or method of preparing *Alloiococcus otitidis* polypeptides comprising transfecting, transforming or infecting cells with a polynucleotide that encodes an *Alloiococcus otitidis* polypeptide to produce transformed host cells; and maintaining the transformed host cells under biological conditions sufficient for expression of the polypeptide. Preferably, the transformed host cells are prokaryotic cells. Alternatively, the host cells are eukaryotic cells. More preferably, the prokaryotic cells are bacterial cells of the DH5α

strain of *Escherichia coli*. Even more preferably, the polynucleotide transfected into the transformed cells comprises the nucleic acid sequence of one of the odd numbered sequences set forth in SEQ ID NO: 1 through SEQ ID NO: 6649. Additionally, transfection is accomplished using an expression vector disclosed above. A host cell used in the process is capable of expressing a functional, recombinant *Alloiococcus otitidis* polypeptide.

Following transfection, the cell is maintained under culture conditions for a period of time sufficient for expression of an *Alloiococcus otitidis* polypeptide. Culture conditions are well known in the art and include ionic composition and concentration, temperature, pH and the like. Typically, transfected cells are maintained under culture conditions in a culture medium. Suitable media for various cell types are well known in the art. In a preferred embodiment, temperature is from about 20°C to about 50°C, more preferably from about 30°C to about 40°C and, even more preferably about 37°C.

The pH is preferably from about a value of 6.0 to a value of about 8.0, more preferably from about a value of about 6.8 to a value of about 7.8 and, most preferably about 7.4. Osmolality is preferably from about 200 milliosmols per liter (mosm/L) to about 400 mosm/l and, more preferably from about 290 mosm/L to about 310 mosm/L. Other biological conditions needed for transfection and expression of an encoded protein are well known in the art.

Transfected cells are maintained for a period of time sufficient for expression of an *Alloiococcus otitidis* polypeptide. A suitable time depends *inter alia* upon the cell type used and is readily determinable by a skilled artisan. Typically, maintenance time is from about 2 to about 14 days.

Recombinant *Alloiococcus otitidis* polypeptide is recovered or collected either from the transfected cells or the medium in which those cells are cultured. Recovery comprises isolating and purifying the *Alloiococcus otitidis* polypeptide. Isolation and purification techniques for polypeptides are well known in the art and include such procedures as precipitation, filtration, chromatography, electrophoresis and the like.

F. ANTIBODIES IMMUNOREACTIVE WITH *ALLOIOCOCCUS OTITIDIS* POLYPEPTIDES

In still another embodiment, the present invention provides antibodies immunoreactive with *Alloiococcus otitidis* polypeptides. Preferably, the antibodies of the

invention are monoclonal antibodies. Additionally, the *Alloiococcus otitidis* polypeptides comprise the amino acid residue sequence of one of the even numbered sequences set forth in SEQ ID NO: 2 through SEQ ID NO: 6650. Means for preparing and characterizing antibodies are well known in the art (*see, e.g.*, Antibodies "A Laboratory Manual", E. Howell and D. Lane, Cold Spring Harbor Laboratory, 1988). Polyclonal antisera is obtained by bleeding an immunized animal into a glass or plastic container, incubating the blood at 25°C for one hour, followed by incubating at 4°C for 2-18 hours. The serum is then recovered by centrifugation.

Briefly, a polyclonal antibody is prepared by immunizing the animal with an immunogen comprising a polypeptide or polynucleotide of the present invention, and collecting antisera from that immunized animal. A wide range of animal species can be used for the production of antisera. Typically an animal used for production of anti-antisera is a rabbit, a mouse, a rat, a hamster or a guinea pig. Because of the relatively large blood volume of rabbits, a rabbit is a preferred choice for production of polyclonal antibodies.

As is well known in the art, a given polypeptide or polynucleotide may vary in its immunogenicity. It is often necessary therefore to couple the immunogen (*e.g.*, a polypeptide or polynucleotide) of the present invention with a carrier. Exemplary and preferred carriers are keyhole limpet hemocyanin (KLH) and bovine serum albumin (BSA). Other albumins such as ovalbumin, mouse serum albumin or rabbit serum albumin can also be used as carriers.

Means for conjugating a polypeptide or a polynucleotide to a carrier protein are well known in the art and include glutaraldehyde, m-maleimidobencoyl-N-hydroxysuccinimide ester, carbodiimide and bis-biazotized benzidine.

The amount of immunogen used for the production of polyclonal antibodies varies *inter alia*, upon the nature of the immunogen as well as the animal used for immunization. A variety of routes can be used to administer the immunogen (subcutaneous, intramuscular, intradermal, intravenous and intraperitoneal). The production of polyclonal antibodies is monitored by sampling blood from the immunized animal at various points following immunization. When a desired level of immunogenicity is obtained, the immunized animal can be bled and the serum isolated and stored.

In another aspect, the present invention contemplates a process of producing an antibody immunoreactive with an *Alloiococcus otitidis* polypeptide comprising the steps

of (a) transfecting recombinant host cells with a polynucleotide that encodes an *Alloiococcus otitidis* polypeptide; (b) culturing the host cells under conditions sufficient for expression of the polypeptide; (c) recovering the polypeptides; and (d) preparing the antibodies to the polypeptides. Preferably, the host cell is transfected with the polynucleotide of one of the odd numbered sequences set forth in SEQ ID NO: 1 through SEQ ID NO: 6649. Even more preferably, the present invention provides antibodies prepared according to the process described above.

A monoclonal antibody of the present invention is readily prepared through use of well-known techniques such as those exemplified in U.S. Pat. No. 4,196,265, herein incorporated by reference. Typically, the technique involves first immunizing a suitable animal with a selected antigen (*e.g.*, a polypeptide or polynucleotide of the present invention) in a manner sufficient to provide an immune response. Rodents such as mice and rats are preferred animals. Spleen cells from the immunized animal are then fused with cells of an immortal myeloma cell. Where the immunized animal is a mouse, a preferred myeloma cell is a murine NS-1 myeloma cell.

The fused spleen/myeloma cells are cultured in a selective medium to select fused spleen/myeloma cells from the parental cells. Fused cells are separated from the mixture of non-fused parental cells, *e.g.*, by the addition of agents that block the *de novo* synthesis of nucleotides in the tissue culture media. Exemplary and preferred agents are aminopterin, methotrexate, and azaserine. Aminopterin and methotrexate block *de novo* synthesis of both purines and pyrimidines, whereas azaserine blocks only purine synthesis. Where aminopterin or methotrexate is used, the media is supplemented with hypoxanthine and thymidine as a source of nucleotides. Where azaserine is used, the media is supplemented with hypoxanthine.

This culturing provides a population of hybridomas from which specific hybridomas are selected. Typically, selection of hybridomas is performed by culturing the cells by single-clone dilution in microtiter plates, followed by testing the individual clonal supernatants for reactivity with an antigen-polypeptide. The selected clones are then propagated indefinitely to provide the monoclonal antibody.

By way of specific example, to produce an antibody of the present invention, mice are injected intraperitoneally with between about 1-200 μg of an antigen comprising a polypeptide of the present invention. B lymphocyte cells are stimulated to grow by injecting the antigen in association with an adjuvant such as complete Freund's adjuvant

(CFA; a non-specific stimulator of the immune response containing killed Mycobacterium tuberculosis). At some time (*e.g.*, at least two weeks) after the first injection, mice are boosted by injection with a second dose of the antigen mixed with incomplete Freund's adjuvant (IFA; lacks the killed mycobacterium of CFA).

A few weeks after the second injection, mice are tail bled and the sera titered by immunoprecipitation against radiolabeled antigen. Preferably, the process of boosting and titering is repeated until a suitable titer is achieved. The spleen of the mouse with the highest titer is removed and the spleen lymphocytes are obtained by homogenizing the spleen with a syringe. Typically, a spleen from an immunized mouse contains approximately 5×10^7 to 2×10^8 lymphocytes.

Mutant lymphocyte cells known as myeloma cells are obtained from laboratory animals in which such cells have been induced to grow by a variety of well-known methods. Myeloma cells lack the salvage pathway of nucleotide biosynthesis. Because myeloma cells are tumor cells, they can be propagated indefinitely in tissue culture, and are thus denominated immortal. Numerous cultured cell lines of myeloma cells from mice and rats, such as murine NS-1 myeloma cells, have been established.

Myeloma cells are combined under conditions appropriate to foster fusion with the normal antibody-producing cells from the spleen of the mouse or rat injected with the antigen/polypeptide of the present invention. Fusion conditions include, for example, the presence of polyethylene glycol. The resulting fused cells are hybridoma cells. Like myeloma cells, hybridoma cells grow indefinitely in culture.

Hybridoma cells are separated from unfused myeloma cells by culturing in a selection medium such as HAT media (hypoxanthine, aminopterin, thymidine). Unfused myeloma cells lack the enzymes necessary to synthesize nucleotides from the salvage pathway because they are killed in the presence of aminopterin, methotrexate, or azaserine. Unfused lymphocytes also do not continue to grow in tissue culture. Thus, only cells that have successfully fused (hybridoma cells) can grow in the selection media.

Each of the surviving hybridoma cells produces a single antibody. These cells are then screened for the production of the specific antibody immunoreactive with an antigen/polypeptide of the present invention. Single cell hybridomas are isolated by limiting dilutions of the hybridomas. The hybridomas are serially diluted many times and, after the dilutions are allowed to grow, the supernatant is tested for the presence of the

monoclonal antibody. The clones producing that antibody are then cultured in large amounts to produce an antibody of the present invention in convenient quantity.

By use of a monoclonal antibody of the present invention, specific polypeptides and polynucleotide of the invention are identified as antigens. Once identified, those polypeptides and polynucleotide are isolated and purified by techniques such as antibody-affinity chromatography. In antibody-affinity chromatography, a monoclonal antibody is bound to a solid substrate and exposed to a solution containing the desired antigen. The antigen is removed from the solution through an immunospecific reaction with the bound antibody. The polypeptide or polynucleotide is then easily removed from the substrate and purified.

Additionally, examples of methods and reagents particularly amenable for use in generating and screening an antibody display library can be found in, for example, U.S. 5,223,409; WO 92/18619; WO 91/17271; WO 92/20791; WO 92/15679; WO 93/01288; WO 92/01047; WO 92/09690; WO 90/02809, which are incorporated herein in their entirety by reference.

Additionally, recombinant anti-*Alloiococcus otitidis* antibodies, such as chimeric and humanized monoclonal antibodies, comprising both human and non-human fragments, which are made using standard recombinant DNA techniques, are within the scope of the invention. Such chimeric and humanized monoclonal antibodies are produced by recombinant DNA techniques known in the art, for example using methods described in PCT/US86/02269; EP 184,187; EP 171,496; EP 173,494; WO 86/01533; U.S. 4,816,567; and EP 125,023.

An anti-*Alloiococcus otitidis* antibody (*e.g.*, monoclonal antibody) is used to isolate *Alloiococcus otitidis* polypeptides by standard techniques, such as affinity chromatography or immunoprecipitation. An anti-*Alloiococcus otitidis* antibody facilitates the purification of a natural *Alloiococcus otitidis* polypeptide from cells and recombinantly produced *Alloiococcus otitidis* polypeptides expressed in host cells. Moreover, an anti-*Alloiococcus otitidis* antibody is used to detect *Alloiococcus otitidis* polypeptide (*e.g.*, in a cellular lysate or cell supernatant) in order to evaluate the abundance of the *Alloiococcus otitidis* polypeptide. The detection of circulating fragments of an *Alloiococcus otitidis* polypeptide is used to identify *Alloiococcus otitidis* polypeptide turnover in a subject. Anti-*Alloiococcus otitidis* antibodies are used diagnostically to monitor protein levels in tissue as part of a clinical testing procedure, *e.g.*, to, for example, determine the efficacy

of a given treatment regimen. Detection is facilitated by coupling (*i.e.*, physically linking) the antibody to a detectable substance. Examples of detectable substances include various enzymes, prosthetic groups, fluorescent materials, luminescent materials, bioluminescent materials, and radioactive materials. Examples of suitable enzymes include horseradish peroxidase, alkaline phosphatase, P-galactosidase, or acetylcholinesterase; examples of suitable prosthetic group complexes include streptavidin/biotin and avidin/biotin; examples of suitable fluorescent materials include umbelliferone, fluorescein, fluorescein isothiocyanate, rhodamine, dichlorotriazinylarnine fluorescein, dansyl chloride or phycoerythrin; an example of a luminescent material includes luminol; examples of bioluminescent materials include luciferase, luciferin, and acquorin, and examples of suitable radioactive material include ^{125}I, ^{131}I, ^{15}S or ^{3}H.

G. PHARMACEUTICAL AND IMMUNOGENIC COMPOSITIONS

In certain embodiments, the present invention provides pharmaceutical and immunogenic compositions comprising *Alloiococcus otitidis* polypeptides, and physiologically acceptable carriers. More preferably, the pharmaceutical and immunogenic compositions comprise *Alloiococcus otitidis* polypeptides comprising the amino acid residue sequence of one or more of the even numbered sequences set forth in SEQ ID NO: 2 through SEQ ID NO: 6650. In other embodiments, the pharmaceutical and immunogenic compositions of the invention comprise polynucleotides that encode *Alloiococcus otitidis* polypeptides, such as the polynucleotides comprising the nucleotide sequence of one of odd numbered sequences set forth in SEQ ID NO: 1 through SEQ ID NO: 6649, and physiologically acceptable carriers. Various tests may be used to assess the *in vitro* immunogenicity of the polypeptides of the invention. For example, an *in vitro* opsonic assay is conducted by incubating together a mixture of *Alloiococcus otitidis* cells, heat inactivated human serum containing specific antibodies to the polypeptide in question, and an exogenous complement source. Opsonophagocytosis proceeds during incubation of freshly isolated human polymorphonuclear cells (PMN) and the antibody/complement/Alloiococcal cell mixture. Bacterial cells that are coated with antibody and complement are killed upon opsonophagocytosis. Colony forming units (cfu) of surviving bacteria that escape from opsonophagocytosis are determined by plating the assay mixture. Titers are reported as the reciprocal of the highest dilution

that gives ≥ 50% bacterial killing, as determined comparison to assay controls. The method described above is a modification of Gray's method (Gray, B.M., 1990).

A whole *Alloiococcus otitidis* cell ELISA assay is also used to assess *in vitro* immunogenicity and surface exposure of the polypeptide antigen, wherein the bacterial strain of interest (*Alloiococcus otitidis*) is coated onto a plate, such as 96 well plate, and test sera from an immunized animal is reacted with bacterial cells. If any antibody, specific for the test polypeptide antigen, is reactive with surface exposed epitope of the polypeptide antigen, it can be detected by standard methods known to one of skill in the art.

Any polypeptide demonstrating the desired *in vitro* activity is then tested in an *in vivo* animal challenge model. In certain embodiments, immunogenic compositions are used in the immunization of an animal (e.g., a mouse) by methods and routes of immunization known to those of skill in the art (e.g., intranasal, parenteral, intraperitoneal, intravenous, subcutaneous, etc.). Following immunization of the animal with a particular *Alloiococcus otitidis* immunogenic composition, the animal is challenged with *Alloiococcus otitidis* and assayed for resistance to *Alloiococcus otitidis* infection.

The *Alloiococcus otitidis* polynucleotides and polypeptides, and modulators of *Alloiococcus otitidis* polynucleotides and polypeptides, and anti-*Alloiococcus otitidis* antibodies (also referred to herein as "active compounds") of the invention can be incorporated into pharmaceutical and immunogenic compositions suitable for administration to a subject, *e.g.*, a human. Such compositions typically comprise the nucleic acid molecule, protein, modulator, or antibody and a pharmaceutically acceptable carrier. As used herein the language "pharmaceutically acceptable carrier" is intended to include any and all solvents, dispersion media, coatings, antibacterial and antifungal agents, isotonic and absorption delaying agents, and the like, compatible with pharmaceutical administration. The use of such media and agents for pharmaceutically active substances is well known in the art. Except insofar as any conventional media or agent is incompatible with the active compound, such media can be used in the compositions of the invention. Supplementary active compounds can also be incorporated into the compositions.

A pharmaceutical or immunogenic composition of the invention is formulated to be compatible with its intended route of administration. Examples of routes of administration include parenteral, (*e.g.*, intravenous, intradermal, subcutaneous,

intramuscular, and intraperitoneal), mucosal (*e.g.*, oral, rectal, buccal, vaginal, intranasal, inhalation), and transdermal (topical). Solutions or suspensions used for parenteral, intradermal, or subcutaneous application can include the following components: a sterile diluents such as water for injection, saline solution, fixed oils, polyethylene glycols, glycerine, propylene glycol or other synthetic solvents; antibacterial agents such as benzyl alcohol or methyl parabens; antioxidants such as ascorbic acid or sodium bisulfite; chelating agents such as ethylenediaminetetraacetic acid; buffers such as acetates, citrates or phosphates and agents for the adjustment of tonicity such as sodium chloride or dextrose. pH can be adjusted with acids or bases, such as hydrochloric acid or sodium hydroxide. The parenteral preparation can be enclosed in ampoules, disposable syringes or multiple dose vials made of glass or plastic.

Pharmaceutical compositions suitable for injectable use include sterile aqueous solutions (where water soluble) or dispersions and sterile powders for the extemporaneous preparation of sterile injectable solutions or dispersion. For intravenous administration, suitable carriers include physiological saline, bacteriostatic water, Cremophor EL™(BASF, Parsippany, NJ) or phosphate buffered saline (PBS). In all cases, the composition must be sterile and should be fluid to the extent that easy syringability exists. It must be stable under the conditions of manufacture and storage and must be preserved against the contaminating action of microorganisms such as bacteria and fungi. The carrier is a solvent or dispersion medium containing, for example, water, ethanol, polyol (for example, glycerol, propylene glycol, and liquid polyetheylene glycol, and the like), and suitable mixtures thereof. The proper fluidity is maintained, for example, by the use of a coating such as lecithin, by the maintenance of the required particle size in the case of dispersion and by the use of surfactants. Prevention of the action of microorganisms is achieved by various antibacterial and antifungal agents, for example, parabens, chlorobutanol, phenol, ascorbic acid, thimerosal, and the like. In many cases, it is preferable to include isotonic agents, for example, sugars, polyalcohols such as manitol, sorbitol, and sodium chloride in the composition. Prolonged absorption of the injectable compositions is brought about by including in the composition an agent which delays absorption, for example, aluminum monostearate and gelatin.

Sterile injectable solutions are prepared by incorporating the active compound (*e.g.*, an *Alloiococcus otitidis* polypeptide or anti-*Alloiococcus otitidis* antibody) in the

required amount in an appropriate solvent with one or a combination of ingredients enumerated above, as required, followed by filtered sterilization. Generally, dispersions are prepared by incorporating the active compound into a sterile vehicle which contains a basic dispersion medium and the required other ingredients from those enumerated above. In the case of sterile powders for the preparation of sterile injectable solutions, the preferred methods of preparation are vacuum drying and freeze-drying which yields a powder of the active ingredient plus any additional desired ingredient from a previously sterile-filtered solution thereof.

Oral compositions generally include an inert diluent or an edible carrier. They can be enclosed in gelatin capsules or compressed into tablets. For the purpose of oral therapeutic administration, the active compound is incorporated with excipients and used in the form of tablets, troches, or capsules. Oral compositions are also prepared using a fluid carrier for use as a mouthwash, wherein the compound in the fluid carrier is applied orally and swished and expectorated or swallowed. Pharmaceutically compatible binding agents, and/or adjuvant materials can be included as part of the composition. The tablets, pills, capsules, troches and the like can contain any of the following ingredients, or compounds of a similar nature: a binder such as microcrystalline cellulose, gum tragacanth or gelatin; an excipient such as starch or lactose, a disintegrating agent such as alginic acid, Primogel, or corn starch; a lubricant such as magnesium stearate or Sterotes; a glidant such as colloidal silicon dioxide; a sweetening agent such as sucrose or saccharin; or a flavoring agent such as peppermint, methyl salicylate, or orange flavoring.

For administration by inhalation, the compounds are delivered in the form of an aerosol spray from pressured container or dispenser that contains a suitable propellant, *e.g.*, a gas such as carbon dioxide, or a nebulizer. Systemic administration can also be by mucosal or transdermal means. For mucosal or transdermal administration, penetrants appropriate to the barrier to be permeated are used in the formulation. Such penetrants are generally known in the art, and include, for example, for mucosal administration, detergents, bile salts, and fusidic acid derivatives. Mucosal administration is accomplished through the use of nasal sprays or suppositories. For transdermal administration, the active compounds are formulated into ointments, salves, gels, or creams as generally known in the art.

The compounds is also prepared in the form of suppositories (*e.g.*, with conventional suppository bases such as cocoa butter and other glycerides) or retention enemas for rectal delivery.

In one embodiment, the active compounds are prepared with carriers that will protect the compound against rapid elimination from the body, such as a controlled release formulation, including implants and microencapsulated delivery systems.

Biodegradable, biocompatible polymers can be used, such as ethylene vinyl acetate, polyanhydrides, polyglycolic acid, collagen, polyorthoesters, and polylactic acid. Methods for preparation of such formulations will be apparent to those skilled in the art. The materials are also obtained commercially from Alza Corporation (Palo Alto, CA) and Nova Pharmaceuticals, Inc. (Clifton, NJ) Liposomal suspensions (including liposomes targeted to infected cells with monoclonal antibodies to viral antigens) are also used as pharmaceutically acceptable carriers. These are prepared according to methods known to those skilled in the art, for example, as described in U.S. 4,522,811, which is incorporated herein by reference.

It is especially advantageous to formulate oral or parenteral compositions in dosage unit form for ease of administration and uniformity of dosage. Dosage unit form as used herein refers to physically discrete units suited as unitary dosages for the subject to be treated; each unit containing a predetermined quantity of active compound calculated to produce the desired therapeutic effect in association with the required pharmaceutical carrier. The specification for the dosage unit forms of the invention are dictated by and directly dependent on the unique characteristics of the active compound and the particular therapeutic effect to be achieved, and the limitations inherent in the art of compounding such an active compound for the treatment of individuals.

Combination immunogenic compositions are provided by including two or more of the polypeptides of this invention. Multivalent immunogenic compositions directed against various bacteria responsible for causing otitis media comprise one or more of the polypeptides of this invention together with one or more known nontypable *Haemophilus influenzae* polypeptides, including, but not limited to, the P2, P4, P5, P6 and PCP proteins, and/or one or more known *Moraxella catarrhalis* polypeptides, including, but not limited to, the UspA1, UspA2, B1, C/D, E and 74 kDa proteins, and/or one or more known *Streptococcus pneumoniae* polypeptides and polysaccharide-protein conjugates, including, but not limited to, the currently available 23-valent pneumococcal capsular

polysaccharide vaccine and the 7-valent pneumococcal polysaccharide-protein conjugate vaccine. One particularly preferred multivalent immunogenic composition comprises one or more of *Alloiococcus otitidis* polypeptides of the invention together with P4, P6, and UspA2 polypeptides.

The nucleic acid molecules of the invention are inserted into a variety of vectors and expression systems. A great variety of expression systems are used. Such systems include, among others, chromosomal, episomal and virus-derived systems, *e.g.*, vectors derived from bacterial plasmids, attenuated bacteria such as Salmonella (U.S. Patent Number 4,837,151) from bacteriophage, from transposons, from yeast episomes, from insertion elements, from yeast chromosomal elements, from viruses such as vaccinia and other poxviruses, sindbis, adenovirus, baculoviruses, papova viruses, such as SV40, fowl pox viruses, pseudorabies viruses and retroviruses, alphaviruses such as Venezuelan equine encephalitis virus (U.S. Patent Number 5,643,576), nonsegmented negative-stranded RNA viruses such as vesicular stomatitis virus (U.S. Patent Number 6,168,943), and vectors derived from combinations thereof, such as those derived from plasmid and bacteriophage genetic elements, such as cosmids and phagemids. The expression systems should include control regions that regulate as well as engender expression, such as promoters and other regulatory elements (such as a polyadenylation signal). Generally, any system or vector suitable to maintain, propagate or express polynucleotides to produce a polypeptide in a host may be used. The appropriate nucleotide sequence may be inserted into an expression system by any of a variety of well-known and routine techniques, such as, for example, those set forth in Sambrook *et al.*, "Molecular Cloning: A Laboratory Manual" 2nd, ed, Cold Spring Harbor Laboratory, Cold Spring Harbor Laboratory Press, Cold Spring Harbor, NY, 1989.

The nucleic acid molecules of the invention inserted into vectors as described above are also used to deliver the nucleic acid molecules to a subject by, for example, intravenous injection, local administration (*see* U.S. Patent 5,328,470) or by stereotactic injection (*see e.g.*, Chen *et al.*, 1994). The pharmaceutical preparation for the administration of the nucleic acid molecules of the invention include, in addition to the nucleic molecules in an appropriate vector, an acceptable diluent, or can comprise a slow release matrix in which the nucleic acid molecule is embedded. Alternatively, where the complete nucleic acid molecule-r is produced intact from recombinant cells, *e.g.* retroviral vectors, the pharmaceutical preparation includes one or more cells which

produce the gene delivery system. The pharmaceutical compositions are included in a container, pack, or dispenser together with instructions for administration.

A pharmaceutically acceptable vehicle is understood to designate a compound or a combination of compounds entering into a pharmaceutical or immunogenic composition which does not cause side effects and which makes it possible, for example, to facilitate the administration of the active compound, to increase its life and/or its efficacy in the body, to increase its solubility in solution or alternatively to enhance its preservation. These pharmaceutically acceptable vehicles are well known and will be adapted by persons skilled in the art according to the nature and the mode of administration of the active compound chosen.

Immunogenic compositions may comprise appropriate adjuvants to modulate, shift and/or boost the immune response of the recipient to the immunogen. Such adjuvants are known to persons skilled in the art, such as those described in section H below.

A composition of the present invention is typically administered parenterally in dosage unit formulations containing standard, well-known nontoxic physiologically acceptable carriers, adjuvants, and vehicles as desired. The term parenteral as used herein includes intravenous, intramuscular, subcutaneous, intradermal, intraarterial injection, or infusion techniques, as well as other conventional techniques or routes described above.

Injectable preparations, for example sterile injectable aqueous or oleaginous suspensions, are formulated according to the known art using suitable dispersing or wetting agents and suspending agents. The sterile injectable preparation can also be a sterile injectable solution or suspension in a nontoxic parenterally acceptable diluent or solvent, for example, as a solution in 1,3-butanediol.

Among the acceptable vehicles and solvents that may be employed are water, Ringer's solution, and isotonic sodium chloride solution. In addition, sterile, fixed oils are conventionally employed as a solvent or suspending medium. For this purpose any bland fixed oil is employed including synthetic mono- or di-glycerides. In addition, fatty acids such as oleic acid find use in the preparation of injectables.

Preferred carriers include neutral saline solutions buffered with phosphate, lactate, Tris, and the like. When administering viral vectors, the vector is purified sufficiently to render it essentially free of undesirable contaminants, such as defective

interfering adenovirus particles or endotoxins and other pyrogens such that it does not cause any untoward reactions in the individual receiving the vector construct. A preferred means of purifying the vector involves the use of buoyant density gradients, such as cesium chloride gradient centrifugation.

A carrier can also be a liposome. Means for using liposomes as delivery vehicles are well known in the art (*see, e.g.* Gabizon *et al.*, 1990; and Ranade, V. V., 1989).

The immunogenic compositions of this invention also comprise a polynucleotide sequence of this invention operatively associated with a regulatory sequence that controls gene expression. The polynucleotide sequence of interest is engineered into an expression vector, such as a plasmid, under the control of regulatory elements which will promote expression of the DNA, that is, promoter and/or enhancer elements. In a preferred embodiment, the human cytomegalovirus immediate-early promoter/enhancer is used (U.S. Patent Number 5,168,062). The promoter may be cell specific and permit increased expression of the polynucleotide only in predetermined cells.

The polynucleotide is introduced directly into the host either as "naked" DNA (U.S. Patent Number 5,580,859) or formulated in compositions with agents which facilitate immunization, such as bupivicaine and other local anesthetics (U.S. Patent Number 6,127,170).

In this polynucleotide immunization procedure, the polypeptides of the invention are expressed on a transient basis *in vivo;* no genetic material is inserted or integrated into the chromosomes of the host. This procedure is to be distinguished from gene therapy, where the goal is to insert or integrate the genetic material of interest into the chromosome. An assay is used to confirm that the polynucleotides administered by immunization do not rise to a transformed phenotype in the host (U.S. Patent Number 6,168,918).

H. USES AND METHODS OF THE INVENTION

The *Alloiococcus otitidis* polynucleotides, polypeptides, polypeptide homologues, modulators, adjuvants, and antibodies described in this invention are used in methods of treatment, diagnostic assays particularly in disease identification, drug screening assays and monitoring of effects during clinical trials. The isolated polynucleotides of the invention are used to express *Alloiococcus otitidis* polypeptides (*e.g.*, *via* a recombinant expression vector in a host cell or in gene therapy applications) and to detect

Alloiococcus otitidis mRNA (*e.g.*, in a biological sample). Moreover, the anti-*Alloiococcus otitidis* antibodies of the invention are used to detect and isolate an *Alloiococcus otitidis* polypeptide, particularly fragments of an *Alloiococcus otitidis* polypeptides present in a biological sample, and to modulate *Alloiococcus otitidis* polypeptide activity.

The invention provides immunogenic compositions comprising polypeptides having an amino acid sequence chosen from one or more of the even numbered sequences set forth in SEQ ID NO: 2 through SEQ ID NO: 6650, a biological equivalent thereof or a fragment thereof. The immunogenic composition may further comprise a pharmaceutically acceptable carrier, as outlined in section G.

In certain preferred embodiments, the immunogenic composition will comprise one or more adjuvants. As defined herein, an "adjuvant" is a substance that serves to enhance the immunogenicity of an "antigen" or the immunogenic compositions comprising a polypeptide antigens having an amino acid sequence chosen from one or more of even numbered sequences set forth in SEQ ID NO: 2 through SEQ ID NO: 6650. Thus, adjuvants are often given to boost the immune response and are well known to the skilled artisan. Preferred adjuvants to enhance effectiveness of the composition include, but are not limited to: (1) aluminum salts (alum), such as aluminum hydroxide, aluminum phosphate, aluminum sulfate, etc; (2) oil-in-water emulsion formulations (with or without other specific immunostimulating agents such as muramyl peptides (see below) or bacterial cell wall components), such as for example (a) MF59 (PCT Publ. No. WO90/14837), containing 5% Squalene, 0.5% Tween 80, and 0.5% Span 85 (optionally containing various amounts of MTP-PE (see below, although not required) formulated into submicron particles using a microfluidizer such as Model 110Y microfluidizer (Microfluidics, Newton, MA), (b) SAF, containing 10% Squalane, 0.4% Tween 80, 5% pluronic-blocked polymer L121, and thr-MDP (see below) either microfluidized into a submicron emulsion or vortexed to generate a larger particle size emulsion, and (c) Ribi™ adjuvant system (RAS), (Corixa, Hamilton, MT) containing 2% Squalene, 0.2% Tween 80, and one or more bacterial cell wall components from the group consisting of 3-O-deacylated monophosphorylipid A (MPL ™) described in U.S. Patent No. 4,912,094 (Corixa), trehalose dimycolate (TDM), and cell wall skeleton (CWS), preferably MPL + CWS (Detox™), (3) saponin adjuvants, such as Quil A or STIMULON™ QS-21 (Antigenics, Framingham, MA) (U.S. Patent No. 5,057,540) may be used or particles generated therefrom such as ISCOMs (immunostimulating complexes);

(4) bacterial lipopolysaccharides, synthetic lipid A analogs such as aminoalkyl glucosamine phosphate compounds (AGP), or derivatives or analogs thereof, which are available from Corixa, and which are described in U.S. Patent Number 6,113,918; one such AGP is 2-[(R)-3-Tetradecanoyloxytetradecanoylamino]ethyl 2-Deoxy-4-O-phosphono-3-O-[(R)-3-tetradecanoyoxytetradecanoyl]-2-[(R)-3-tetradecanoyoxytetradecanoylamino]-b-D-glucopyranoside, which is also known as 529 (formerly known as RC529), which is formulated as an aqueous form or as a stable emulsion, synthetic polynucleotides such as oligonucleotides containing CpG motif(s) (U.S. Patent Number 6,207,646); (5) cytokines, such as interleukins (e.g., IL-1, IL-2, IL-4, IL-5, IL-6, IL-7, IL-12, IL-15, IL-18, *etc.*), interferons (e.g., gamma interferon), granulocyte macrophage colony stimulating factor (GM-CSF), macrophage colony stimulating factor (M-CSF), tumor necrosis factor (TNF), etc; (6) detoxified mutants of a bacterial ADP-ribosylating toxin such as a cholera toxin (CT) either in a wild-type or mutant form, for example, wherein the glutamic acid at amino acid position is replaced by another amino acid, preferably a histidine, in accordance with published International patent Application number WO 00/18434, a pertussis toxin (PT, or an E. coli heat-labile toxin (LT), particularly LT-K63, LT-R72, CT-S109, PT-K9/G129; see, e.g., WO 93/13302 and WO 92/19265; and (7) other substances that act as immunostimulating agents to enhance the effectiveness of the composition.

As mentioned above, muramyl peptides include, but are not limited to, N-acetyl-muramyl-L-threonyl-D-isoglutamine (thr-MDP), N-acetyl-normuramyl-L-alanine-2-(1'-2' dipalmitoyl-*sn*-glycero-3-huydroxyphosphoryloxy)-ethylamine (MTP-PE), etc.

In another embodiment, the invention provides immunogenic compositions comprising a polynucleotide having a nucleotide sequence chosen from one or more of the odd numbered sequences set forth in SEQ ID NO: 1 through SEQ ID NO: 6649, wherein the polynucleotide is comprised in a recombinant expression vector. Preferably the vector is plasmid DNA. The polynucleotide may further comprise heterologous nucleotides, *e.g.*, the polynucleotide is operatively linked to one or more gene expression regulatory elements, and further comprise one or more adjuvants. In a preferred embodiment, the immunogenic polynucleotide composition directs the expression of a neutralizing epitope of *Alloiococcus otitidis*.

Provided also are methods for immunizing a host against *Alloiococcus otitidis* infection. In a preferred embodiment, the host is human. Thus, a host or subject is

administered an immunogenic amount of an immunogenic composition comprising a polypeptide having an amino acid sequence chosen from one or more of the even numbered sequences set forth in SEQ ID NO: 2 through SEQ ID NO: 6650, a biological equivalent thereof or a fragment thereof and a pharmaceutically acceptable carrier. An immunogenic amount of an immunogenic composition is determined by doing a dose response study in which subjects are immunized with gradually increasing amounts of the immunogenic composition and the immune response analyzed to determine the optimal dosage. Starting points for the study is inferred from immunization data in animal models. The dosage amount can vary depending upon specific conditions of the individual. The amount can be determined in routine trials by means known to those skilled in the art.

An "immunologically effective amount" of the immunogenic composition in an appropriate number of doses is administered to the subject to elicit an immune response. "Immunologically effective amount", as used herein, means the administration of that amount to a mammalian host (preferably human), either in a single dose or as part of a series of doses, sufficient to at least cause the immune system of the individual treated to generate a response that reduces the clinical impact of the bacterial infection. Protection may be conferred by a single dose of the immunogenic composition, or may require the administration of several doses, in addition to booster doses at later times to maintain protection. This may range from a minimal decrease in bacterial burden to prevention of the infection. Ideally, the treated individuals will not exhibit the more serious clinical manifestations of the *Alloiococcus otitidis* infection. The dosage amount can vary depending upon specific conditions of the individual, such as age and weight. The amount can be determined in routine trials by means known to those skilled in the art.

I. DIAGNOSTIC ASSAYS

The invention provides methods for detecting the presence of an *Alloiococcus otitidis* polypeptide or *Alloiococcus otitidis* polynucleotide, or fragment thereof, in a biological sample. The method involves contacting the biological sample with a compound or an agent capable of detecting an *Alloiococcus otitidis* polypeptide or mRNA such that the presence of the *Alloiococcus otitidis* polypeptide/encoding nucleic acid molecule is detected in the biological sample. A preferred agent for detecting

Alloiococcus otitidis mRNA or DNA is a labeled or labelable oligonucleotide probe capable of hybridizing to *Alloiococcus otitidis* mRNA or DNA. The nucleic acid probe can be, for example, a full-length *Alloiococcus otitidis* polynucleotide of one of the odd numbered sequences set forth in SEQ ID NO: 1 through SEQ ID NO: 6649, a complement thereof, or a fragment thereof, such as an oligonucleotide of at least 15, 30, 50, 100, 250 or 500 nucleotides in length and sufficient to specifically hybridize under stringent conditions to *Alloiococcus otitidis* mRNA or DNA. Alternatively, the sample can be contacted with an oligonucleotide primer of an *Alloiococcus otitidis* polynucleotide of one of the odd numbered sequences set forth in SEQ ID NO: 1 through SEQ ID No: 6649, a complement thereof, or a fragment thereof, in the presence of nucleotides and a polymerase, under conditions permitting primer extension.

A preferred agent for detecting an *Alloiococcus otitidis* polypeptide is a labeled or labelable antibody capable of binding to an *Alloiococcus otitidis* polypeptide of one of the even numbered sequences set forth in SEQ. ID. NO.: 2 through SEQ. ID. NO. 6650. Antibodies can be polyclonal, or more preferably, monoclonal. An intact antibody, or a fragment thereof (*e.g.*, Fab or $F(ab')_2$) can be used. The term "labeled or labelable," with regard to the probe or antibody, is intended to encompass direct labeling of the probe or antibody by coupling (*i.e.*, physically linking) a detectable substance to the probe or antibody, as well as indirect labeling of the probe or antibody by reactivity with another reagent that is directly labeled. Examples of indirect labeling include detection of a primary antibody using a fluorescently labeled secondary antibody and end-labeling of a DNA probe with biotin such that it are detected with fluorescently labeled streptavidin. The term "biological sample" is intended to include tissues, cells and biological fluids isolated from a subject, as well as tissues, cells and fluids present within a subject. That is, the detection method of the invention can be used to detect *Alloiococcus otitidis* mRNA, DNA or protein in a biological sample *in vitro* as well as *in vivo*. For example, *in vitro* techniques for detection of *Alloiococcus otitidis* mRNA include Northern hybridizations and *in situ* hybridizations. *In vitro* techniques for detection of *Alloiococcus otitidis* polypeptide include enzyme linked immunosorbent assays (ELISAs), Western blots, immunoprecipitations and immunofluorescence. Alternatively, *Alloiococcus otitidis* polypeptides can be detected *in vivo* in a subject by introducing into the subject a labeled anti-*Alloiococcus otitidis* antibody. For example, the antibody can be labeled with a

radioactive marker whose presence and location in a subject can be detected by standard imaging techniques.

The polynucleotides according to the invention may also be used in analytical DNA chips, which allow sequencing, the study of mutations and of the expression of genes, and which are currently of interest given their very small size and their high capacity in terms of number of analyses.

The principle of the operation of these chips is based on molecular probes, most often oligonucleotides, which are attached onto a miniaturized surface, generally of the order of a few square centimeters. During an analysis, a sample containing fragments of a target nucleic acid to be analyzed, for example DNA or RNA labeled, for example, after amplification, is deposited onto the DNA chip in which the support has been coated beforehand with probes. Bringing the labeled target sequences into contact with the probes leads to the formation, through hybridization, of a duplex according to the rule of pairing defined by J.D.Watson and F.Crick. After a washing step, analysis of the surface of the chip allows the effective hybridizations to be located by means of the signals emitted by the labels tagging the target. A hybridization fingerprint results from this analysis which, by appropriate computer processing, will make it possible to determine information such as the presence of specific fragments in the sample, the determination of sequences and the presence of mutations.

The chip consists of a multitude of molecular probes, precisely organized or arrayed on a solid support whose surface is miniaturized. It is at the center of a system where other elements (imaging system, microcomputer) allow the acquisition and interpretation of a hybridization fingerprint.

The hybridization supports are provided in the form of flat or porous surfaces (pierced with wells) composed of various materials. The choice of a support is determined by its physicochemical properties, or more precisely, by the relationship between the latter and the conditions under which the support will be placed during the synthesis or the attachment of the probes or during the use of the chip. It is therefore necessary, before considering the use of a particular support, to consider characteristics such as its stability to pH, its physical strength, its reactivity and its chemical stability as well as its capacity to nonspecifically bind nucleic acids. Materials such as glass, silicon and polymers are commonly used. Their surface is, in a first step, called "functionalization", made reactive towards the groups which it is desired to attach

thereon. After the functionalization, so-called spacer molecules are grafted onto the activated surface. Used as intermediates between the surface and the probe, these molecules of variable size render unimportant the surface properties of the supports, which often prove to be problematic for the synthesis or the attachment of the probes and for the hybridization.

Among the hybridization supports, there may be mentioned glass which is used, for example, in the method of *in situ* synthesis of oligonucleotides by photochemical addressing developed by the company Affymetrix (E.L. Sheldon, 1993), the glass surface being activated by silane. Genosensor Consortium (P. Mérel, 1994) also uses glass slides carrying wells 3 mm apart, this support being activated with epoxysilane.

The probes according to the invention may be synthesized directly *in situ* on the supports of the DNA chips. This *in situ* synthesis may be carried out by photochemical addressing (developed by the company Affymax (Amsterdam, Holland) and exploited industrially by its subsidiary Affymetrix (United States)) or based on the VLSIPS (very large scale immobilized polymer synthesis) technology (S.P.A. Fodor *et al.*, 1991) which is based on a method of photochemically directed combinatory synthesis and the principle of which combines solid-phase chemistry, the use of photolabile protecting groups and photolithography.

The probes according to the invention may be attached to the DNA chips in various ways such as electrochemical addressing, automated addressing or the use of probe printers (T. Livache *et al.*, 1994; G. Yershov *et al.*, 1996; and J. Derisi *et al.*, 1996)

The revealing of the hybridization between the probes of the invention, deposited or synthesized *in situ* on the supports of the DNA chips, and the sample to be analyzed, may be determined, for example, by measurement of fluorescent signals, by radioactive counting or by electronic detection.

The use of fluorescent molecules such as fluorescein constitutes the most common method of labeling the samples. It allows direct or indirect revealing of the hybridization and allows the use of various fluorochromes.

Affymetrix currently provides an apparatus or a scanner designed to read its Gene Chip™ chips. It makes it possible to detect the hybridizations by scanning the surface of the chip in confocal microscopy (R.J. Lipshutz *et al.*, 1995).

The nucleotide sequences according to the invention are also used in DNA chips to carry out the analysis of the expression of the *Alloiococcus otitidis* genes. This

analysis of the expression of *Alloiococcus otitidis* genes is based on the use of chips where probes of the invention, chosen for their specificity to characterize a given gene, are present (D.J. Lockhart *et al.*, 1996; D.D. Shoemaker *et al.*, 1996). For the methods of analysis of gene expression using the DNA chips, reference may, for example, be made to the methods described by D.J. Lockhart *et al.* (1996) and Sosnowsky *et al.* (1997) for the synthesis of probes *in situ* or for the addressing and the attachment of previously synthesized probes. The target sequences to be analyzed are labeled and in general fragmented into sequences of about 50 to 100 nucleotides before being hybridized onto the chip. After washing as described, for example, by D.J. Lockhart *et al.* (1996) and application of different electric fields (Sosnowsky *et al.*, 1997), the labeled compounds are detected and quantified, the hybridizations being carried out at least in duplicate. Comparative analyses of the signal intensities obtained with respect to the same probe for different samples and/or for different probes with the same sample, determine the differential expression of RNA or of DNA derived from the sample.

The nucleotide sequences according to the invention are, in addition, used in DNA chips where other nucleotide probes specific for other microorganisms are also present, and allow the carrying out of a serial test allowing rapid identification of the presence of a microorganism in a sample.

Accordingly, the subject of the invention is also the nucleotide sequences according to the invention, characterized in that they are immobilized on a support of a DNA chip.

The DNA chips, characterized in that they contain at least one nucleotide sequence according to the invention, immobilized on the support of the said chip, also form part of the invention.

The chips preferably contain several probes or nucleotide sequences of the invention of different length and/or corresponding to different genes so as to identify, with greater certainty, the specificity of the target sequences or the desired mutation in the sample to be analyzed.

Accordingly, the analyses carried out by means of primers and/or probes according to the invention, immobilized on supports such as DNA chips, make it possible, for example, to identify, in samples, mutations linked to variations such as intraspecies variations. These variations may be correlated or associated with pathologies specific to the variant identified and make it possible to select the

appropriate treatment.

The invention thus comprises a DNA chip according to the invention, characterized in that it contains, in addition, at least one nucleotide sequence of a microorganism different from *Alloiococcus otitidis,* immobilized on the support of the said chip; preferably, the different microorganism is chosen from an associated microorganism, a bacterium of the *Streptococcus* family, and a variant of the species *Alloiococcus otitidis.*

The principle of the DNA chip as explained above, is also used to produce protein "chips" on which the support has been coated with a polypeptide or an antibody according to the invention, or arrays thereof, in place of the DNA. These protein "chips" make it possible, for example, to analyze the biomolecular interactions (BIA) induced by the affinity capture of target analytes onto a support coated, for example, with proteins, by surface plasma resonance (SPR). Reference may be made, for example, to the techniques for coupling proteins onto a solid support which are described in EP 524 800 or to the methods describing the use of biosensor-type protein chips such as the BIAcore-type technique (Pharmacia) (Arlinghaus *et al.*, 1997 and Krone *et al.*, 1997). These polypeptides or antibodies according to the invention, capable of specifically binding antibodies or polypeptides derived from the sample to be analyzed, are thus used in protein chips for the detection and/or the identification of proteins in samples. The said protein chips may in particular be used for infectious diagnosis and preferably contain, per chip, several polypeptides and/or antibodies of the invention of different specificity, and/or polypeptides and/or antibodies capable of recognizing microorganisms different from *Alloiococcus otitidis.*

Accordingly, the present invention also encompasses polypeptides and the antibodies according to the invention, characterized in that they are immobilized on a support, in particular, on a protein chip.

The protein chips, characterized in that they contain at least one polypeptide or one antibody according to the invention immobilized on the support of the said chip, also form part of the invention.

The invention comprises, in addition, a protein chip according to the invention, characterized in that it contains, in addition, at least one polypeptide of a microorganism different from *Alloiococcus otitidis* or at least one antibody directed against a compound of a microorganism different from *Alloiococcus otitidis,* immobilized on the support of the

chip.

The invention also relates to a kit or set for the detection and/or the identification of bacteria belonging to the species *Alloiococcus otitidis* or to an associated microorganism, or for the detection and/or the identification of a microorganism characterized in that it comprises a protein chip according to the invention.

The present invention also provides a method for the detection and/or the identification of bacteria belonging to the species *Alloiococcus otitidis* or to an associated microorganism in a biological sample, characterized in that it uses a nucleotide sequence according to the invention.

The invention also encompasses kits for detecting the presence of an *Alloiococcus otitidis* polypeptide in a biological sample. For example, the kit comprises reagents such as a labeled or labelable compound or agent capable of detecting *Alloiococcus otitidis* polypeptide or mRNA in a biological sample; means for determining the amount of *Alloiococcus otitidis* polypeptide in the sample; and means for comparing the amount of *Alloiococcus otitidis* polypeptide in the sample with a standard. The compound or agent is packaged in a suitable container. The kit further comprises instructions for using the kit to detect *Alloiococcus otitidis* mRNA or protein.

In certain embodiments, detection involves the use of a probe/primer in a polymerase chain reaction (PCR) (*see, e.g.* U.S. 4,683,195 and U.S. 4,683,202), such as anchor PCR or RACE PCR, or, alternatively, in a ligation chain reaction (LCR). This method includes the steps of collecting a sample of cells from a patient, isolating nucleic acid (*e.g.*, genomic, mRNA or both) from the cells of the sample, contacting the nucleic acid sample with one or more primers which specifically hybridize to an *Alloiococcus otitidis* polynucleotide under conditions such that hybridization and amplification of the *Alloiococcus otitidis*-polynucleotide (if present) occurs, and detecting the presence or absence of an amplification product, or detecting the size of the amplification product and comparing the length to a control sample.

J. TRANSGENIC ANIMALS

It is contemplated that in some instances the genome of a transgenic animal of the present invention will have been altered through the stable introduction of one or more of the *Alloiococcus otitidis* polynucleotide compositions described herein, either native, synthetically modified or mutated. As described herein, a "transgenic animal"

refers to any non-human animal, preferably a non-human mammal (*e.g.* mouse, rat, rabbit, squirrel, hamster, rabbits, guinea pigs, pigs, micro-pigs, prairie, baboons, squirrel monkeys and chimpanzees, *etc*), bird or an amphibian, in which one or more cells contain a heterologous nucleic acid sequence introduced by way of human intervention, such as by transgenic techniques well known in the art. The nucleic acid is introduced into the cell, directly or indirectly, by introduction into a precursor of the cell, by way of deliberate genetic manipulation, such as by microinjection or by infection with a recombinant virus. The term genetic manipulation does not include classical crossbreeding, or *in vitro* fertilization, but rather is directed to the introduction of a recombinant DNA molecule. This molecule may be integrated within a chromosome, or it may be extrachromosomally replicating DNA.

The host cells of the invention are also used to produce non-human transgenic animals. The non-human transgenic animals are used in screening assays designed to identify infections or compounds, *e.g.*, drugs, pharmaceuticals, *etc.*, which are capable of ameliorating *Alloiococcus otitidis* symptoms or infections. For example, in one embodiment, a host cell of the invention is a fertilized oocyte or an embryonic stem cell into which an *Alloiococcus otitidis* polypeptide-coding sequence has been introduced. Such host cells are then used to create non-human transgenic animals in which exogenous *Alloiococcus otitidis* gene sequences have been introduced into their genome or homologous recombinant animals in which endogenous *Alloiococcus otitidis* gene sequences have been altered. Such animals are useful for studying the effects of an *Alloiococcus otitidis* polypeptide and for identifying and/or evaluating modulators of *Alloiococcus otitidis* polypeptide infectivity.

A transgenic animal of the invention is created by introducing an *Alloiococcus otitidis* polypeptide-encoding nucleic acid sequence into the male pronuclei of a fertilized oocyte, *e.g.*, by microinjection, retroviral infection, and allowing the oocyte to develop in a pseudopregnant female foster animal. The human *Alloiococcus otitidis* cDNA sequence of one or more of the odd numbered sequences set forth in SEQ ID NO:1 through SEQ ID NO: 6649 can be introduced as a transgene into the genome of a non-human animal.

Moreover, a non-*Alloiococcus otitidis* homologue of the *Alloiococcus otitidis* gene can be isolated based on hybridization to the *Alloiococcus otitidis* cDNA (described above) and used as a transgene. Intronic sequences and polyadenylation signals can

also be included in the transgene to increase the efficiency of expression of the transgene. A tissue-specific regulatory sequence(s) can be operably linked to the *Alloiococcus otitidis* transgene to direct expression of an *Alloiococcus otitidis* polypeptide to particular cells. Methods for generating transgenic animals *via* embryo manipulation and microinjection, particularly animals such as mice, have become conventional in the art and are described, for example, in U.S. 4,736,866 and 4,870, 009, U.S. 4,873,191 and in Hogan, 1986. Similar methods are used for production of other transgenic animals. A transgenic founder animal can be identified based upon the presence of the *Alloiococcus otitidis* transgene in its genome and/or expression of *Alloiococcus otitidis* mRNA in tissues or cells of the animals. A transgenic founder animal can then be used to breed additional animals carrying the transgene. Moreover, transgenic animals carrying a transgene encoding an *Alloiococcus otitidis* polypeptide can further be bred to other transgenic animals carrying other transgenes.

In another embodiment, transgenic non-human animals can be produced which contain selected systems that allow for regulated expression of the transgene. One example of such a system is the cre/loxP recombinase system of bacteriophage PL. For a description of the cre/loxP recombinase system, *see, e.g.*, Lakso *et al.*, 1992. Another example of a recombinase system is the FLP recombinase system of *Saccharomyces cerevisiae* (O'Gon-nan *et al.*, 1991). If a cre/loxP recombinase system is used to regulate expression of the transgene, animals containing transgenes encoding both the Cre recombinase and a selected protein are required. Such animals can be provided through the construction of "double" transgenic animals, *e.g.*, by mating two transgenic animals, one containing a transgene encoding a selected protein and the other containing a transgene encoding a recombinase.

Clones of the non-human transgenic animals described herein can also be produced according to the methods described in Wilmut *et al.*, 1997, and PCT International Publication Nos. WO 97/07668 and WO 97/07669. In brief, a cell, *e.g.*, a somatic cell, from the transgenic animal can be isolated and induced to exit the growth cycle and enter G_0 phase. The quiescent cell can then be fused, *e.g.*, through the use of electrical pulses, to an enucleated oocyte from an animal of the same species from which the quiescent cell is isolated. The reconstructed oocyte is then cultured such that it develops to morula or blastocyst and then transferred to pseudopregnant female foster

animal. The offspring borne of this female foster animal will be a clone of the animal from which the cell, *e.g.,* the somatic cell, is isolated.

All patents and publications cited herein are hereby incorporated by reference.

K. Examples

The following examples are carried out using standard techniques, which are well known and routine to those of skill in the art, except where otherwise described in detail. The following examples are presented for illustrative purposes only, and should not be construed in any way limiting the scope of this invention.

EXAMPLE 1

CONFIRMATION OF THE IDENTITY OF THE *ALLOIOCOCCUS OTITIDIS* 1104-92 ISOLATE

An *Alloiococcus otitidis* isolate designated 1104-92 was obtained from Dr. Richard Facklam of the Centers for Disease Control and Prevention in Atlanta. It was isolated from the middle ear fluid of a child in the Atlanta, Georgia area. It was confirmed to be *Alloiococcus otitidis* by comparing it to the type strain, ATCC51267, obtained from the American Type Culture Collection (Aguirre, 1992 #1). Both the 1104-92 isolate and the type strain were characterized as Gram positive cocci. Both grow on Columbia agar supplemented with 5% yeast extract, 0.5% polysorbate 80 (Tween 80), and 0.7% phospatidyl choline when incubated at 37°C. On this medium, both strains form slow growing small white colonies that require nearly two days to be easily observed with the naked eye. Both are sensitive to lysis by hen egg white lysozyme and *Streptococcus globisporus* mutanolysin. Both grow in the presence of 2% sodium azide. Both are killed by incubation at 55°C for 30 minutes. The 1104-92 isolate was subjected to polymerase chain reaction (PCR) identification based on its 16s rRNA gene. This was done using two of the primers specified by Aguirre and Collins (Aguirre, 1992 #2). The antisense primer used was ATCTTCCTGCTTGCAGGAAGAGG (Seq. ID No.: 6653) and the sense primer was ACGCTTCATCTCTGAAGCTAGC (Seq. ID No.6652). PCR confirmed that the 1104-92 isolate was a strain of *Alloiococcus otitidis.* Thus by multiple criteria, the 1104-92 strain was confirmed to be an isolate of *Alloiococcus otitidis.*

EXAMPLE 2

STORAGE, GROWTH, AND HARVEST OF *ALLOIOCOCCUS OTITIDIS* 1104-92 ISOLATE FOR THE ISOLATION OF DNA

The *Alloiococcus otitidis* isolate 1104-92 was stored at –70°C in Todd-Hewlett broth containing 40% glycerol. A small portion of the frozen stock was streaked onto the agar medium described in Example 1 and incubated at 37°C for two days. The growth from the plate was swabbed into a 17 × 100cm tube containing 6 ml of a serum-free broth medium. This broth medium was prepared with 30g Todd-Hewlett medium, 5 g yeast extract, 10 ml polysorbate 80 (Tween 80), and 1 liter distilled water. This medium was sterilized by autoclaving for 35 minutes. The bacteria were incubated aerobically without shaking in an aerobic incubator at 37°C for two days. The tube containing the growing bacteria was then shaken to resuspend the bacteria and added to a liter of the same medium in a Fernbach flask. This flask, in turn, was incubated aerobically for three days without shaking. The bacteria were harvested by first swirling the flask to suspend the bacteria and then low speed centrifugation at about 5,000 × g for 30 minutes. The pellet of bacteria was washed by resuspending it in 10 to 15 mL of phosphate buffered saline (PBS), and centrifuging the suspension at about 8,000 × g for 20 minutes. The pellet of bacteria was retained and stored frozen at -20°C. The yield of wet bacterial pellet was typically about 1 g per liter of broth.

EXAMPLE 3

PREPARATION OF ALLOIOCOCCUS OTITIDIS GENOMIC DNA

To prepare genomic DNA, 0.95 g frozen pellet of bacteria was defrosted and suspended in 10 mL of PBS containing 1 mM $MgCl_2$. The bacteria were killed by incubating the suspension at 55°C for 20 minutes. The suspension was allowed to cool before adding 25 µl of a 10 mg/mL stock of hen egg white lysozyme and 50 µl of a 25,000 unit/mL stock of *Streptococcus globisporus* mutanolysin to the suspension. It was then incubated for one hour at 37°C. Then 50 µl of a 10 mg/mL stock of RNase was added and the suspension incubated an additional hour at 37°C. After these incubations, sodium dodecylsulfate (SDS) was added to a final concentration of 0.3% (0.3 mL of a 10% stock). This was followed by the addition of 0.3 mL of a 1 mg/mL stock of proteinase K. The suspension was then incubated for two hours at 37°C. After this time,

an equal volume of water saturated phenol/chloroform/isopropyl (25:24:1) was added to the digested suspension and gently mixed. The upper aqueous layer was retained after a low speed centrifugation and 2.5 volumes of ethanol were added and the tube gently inverted to mix. The DNA was then spooled out on a glass rod and allowed to air dry.

The DNA at this stage still contained obvious impurities and needed further purification. The DNA dried on the glass rod was soaked in 70% ethanol to remove excess phenol and air-dried once again. It was then suspended in 2 ml of Tris-EDTA buffer to which 2 µl of RNase cocktail was added and incubated at room temperature for 75 minutes. Then 100 µl of protease, 100 µl SDS and 40 µl of 100 mM $CaCl_2$ were added and the suspension incubated for 3.5 hours. An equal volume of chloroform was added, gently mixed, and then centrifuged at a low speed. The aqueous layer was collected and re-extracted with the phenol, chloroform, and isopropyl alcohol reagent. In turn, the aqueous layer was extracted with chloroform. At this point, 3 M sodium acetate was added to the aqueous phase collected form the last extraction and then 3.75 ml of ethanol was added and gently mixed. The DNA was spooled out, soaked in 70% ethanol and allowed to air-dry. The DNA was finally suspended in 2 ml of Tris-EDTA buffer. Based on absorption at 260 nm, the final yield of DNA was 482 µg of DNA. The DNA was confirmed to be that of *Alloiococcus otitidis* by the PCR method described in example 1. This DNA was submitted for sequencing. The sequences of all the ORFs were obtained as described in Examples 4 and 5 below, and are set forth in odd numbered sequence listings, Seq. ID No. 1 through Seq. ID No. 6649. The sequence of the entire *Alloiococcus otitidis* genome is set forth in Seq. ID No: 6651.

EXAMPLE 4.

CLONING AND SEQUENCING OF THE *ALLOIOCOCCUS OTITIDIS* GENOME

This invention provides nucleotide sequences of the genome of *Alloiococcus otitidis,* which thus comprises a DNA sequence library of *Alloiococcus otitidis* genomic DNA. The description that follows provides nucleotide sequences of Alloiococcus otitidis, and also describes how the sequences were obtained and how ORFs (Open Reading Frames) and protein-coding sequences were identified.

To construct a library, genomic DNA was hydrodynamically sheared in an HPLC and then separated on a standard 1% agarose gel. A fraction corresponding to 3000-

3500 bp in length was excised from the gel and purified by the GeneClean™ procedure (BIO101, Inc.).

The purified DNA fragments were then blunt-ended using T4 DNA polymerase. The blunt-ended DNA was then ligated to unique BstX1-linker adapters. These linkers are complementary to the pGTC vector, while the overhang is not self-complementary. Therefore, the linkers will not concatermerize nor will the cut-vector religate itself easily. The liner-adapted inserts were separated from the unincorporated linkers on a 1% agarose gel and again purified using GeneClean. The linker-adapted inserts were then ligated to BstX1-cut vector to construct "shotgun" subclone libraries.

Only major modifications to the standard protocols are highlighted. Briefly, the library was transformed into DH10B competent cells (Gibco/BRL, DH5a transformation protocol). Transformed cells were detected by plating onto antibiotic plates containing ampicillin. The plates were incubated overnight at 37° C. Transformant clones were then selected for sequencing. The cultures were grown overnight at 37°C. DNA was purified using a silica bead DNA preparation (Egelstein, 1996) method. In this manner, 25 mg of DNA was obtained per clone.

These purified DNA samples were then sequenced using ABI dye-terminator chemistry. All subsequent steps were based on sequencing by automated DNA sequencing methods. The ABI dye terminator sequence reads were run on MegaBace™ 10000 (Amersham) machines and the data transferred to UNIX based computers. Base calls and quality scores were determined using the PHRED software program (Ewing et al., 1998, Genome Res. 8: 175-185; Ewing and Green, 1998, Genome Res. 8:685-734). Reads were assembled using PHRAP (P. Green, Abstracts of DOE Human Genome Program Contractor-Grantee Workshop V, Jan. 1996, p 157) with default program parameters and quality scores.

To identify *Alloiococcus otitidis* genome encoded polypeptides, the complete genomic sequence of *Alloiococcus otitidis* was analyzed essentially as follows: First, all possible stop-to-stop open reading frames (ORFs) greater than or equal to 222 nucleotides in all three reading frames were translated into amino acid sequences.

Second, the identified ORFs were analyzed for homology to known protein sequences. Third, the coding potential of non-homologous sequences was evaluated with the GeneMark™ software program (Borodovsky and McIninch, 1993, Comp. Chem. 17:123).

EXAMPLE 5.

BIOINFORMATICS AND GENE MINING OF *ALLOIOCOCCUS OTITIDIS*

The genomic sequence of *Alloiococcus otitidis* was examined for suitable open reading frames. ORFs were determined in the following manner. An ORF was defined as having one of three potential start site codons, ATG, GTG, or TTG and one of three potential stop codons, TAA, TAG, TGA. The Applicants used a unique set of three ORF finder algorithms: GLIMMER™ (Salzberg *et al.*, 1998), GeneMark™ (Lukashin and Borodovsky, 1998) and Applicants' assignee's own program to enhance the efficiency for finding "all" ORFs. In order to evaluate the accuracy of the ORFs determined, a program developed by Applicants' assignee called DiCTion was employed that uses a discrete mathematical cosine function to assign a score for each ORF. An ORF with a DiCTion score >1.5 was considered to have a high probability of encoding a protein product. The minimum length of an ORF predicted by the three ORF finders was set to 225 nucleotides (including stop codon) which would encode a protein of 74 amino acids. An in-house graphical analysis program developed by Applicants' assignee also allowed the Applicants to see all six reading frames and the location of the predicted ORFs relative to the genomic sequence. This helped to eliminate those ORFs that have large overlaps with other ORFs, although there are known cases of ORFs being totally embedded within other ORFs (Loessner *et al.,* 1999; Hernandez-Sanchez *et al.*, 1998).

The initial annotation of the *Alloiococcus otitidis* ORFs was performed using the BLAST (v. 2.0) Gapped search algorithm, BlastP, to identify homologous sequences (Altschul *et al.*, 1997). A cutoff 'e' value of anything $<e^{-10}$ was considered significant. Other search algorithms such as FASTA or PSI-BLAST were used as needed. The non-redundant protein sequence database used for the homology searches consisted of GenBank, SWISS-PROT, PIR, and TREMBL database sequences. ORFs with a BlastP result of $>e^{-10}$ were considered to be unique to *Alloiococcus otitidis*.

A keyword search of the entire BLAST results was carried out using known or suspected target genes (those that encode polypeptide candidates for inclusion in immunogenic compositions) as well as words that identified the location of a protein or function.

Several parameters are used to determine partitioning of the predicted proteins. Proteins destined for translocation across the cytoplasmic membrane encode a leader

signal (also called signal sequence) composed of a central hydrophobic region flanked at the N-terminus by positively charged residues (Pugsley, 1993). A program called SignalP identifies signal peptides and their cleavage sites (Nielsen *et al.*, 1997). To predict protein localization in bacteria, the software PSORT has been used (Nakai and Kanehisa, 1991). This program uses a neural net algorithm to predict localization of proteins to the 'cytoplasm', 'periplasm', and 'cytoplasmic membrane' for Gram-positive bacteria as well as 'outer membrane' for Gram-negative bacteria. Transmembrane (TM) domains of proteins have been detected using the software program TopPred2 (Cserzo *et al.*, 1997).

The Hidden Markov Model (HMM) Pfam database of multiple alignments of protein domains or conserved protein regions (Sonnhammer *et al.*, 1997) was used to identify *Alloiococcus otitidis* proteins that may belong to an existing protein family. Keyword searching of this output was used to help identify additional candidate polypeptides that may have been missed by the BLAST search criteria. Additional HMM models were developed by Applicants' assignee. A computer algorithm, called HMM Lipo, was developed internally to predict lipoproteins using 131 biologically proven bacterial lipoproteins. This training set was generated from experimentally proven prokaryotic lipoproteins. The protein sequence from the start of the protein to the cysteine amino acid plus the next two additional amino acids was used to generate the HMM. Using approximately 70 known prokaryotic proteins containing the LPXTG cell wall sorting signal, a HMM (Eddy, 1996), was developed to predict cell wall proteins that are anchored to the peptidoglycan layer (Mazmanian *et al.*, 1999; Navarre and Schneewind, 1999). The model used not only the LPXTG sequence, but also included two features of the downstream sequence, the hydrophobic transmembrane domain and the positively charged carboxy terminus. There are also a number of proteins that interact, non-covalently, with the peptidoglycan layer and are distinct from the LPXTG protein class described above. These proteins seem to have a consensus sequence at their carboxy terminus (Koebnik, 1995). The Applicants also have developed and used a HMM of this region to identify any *Alloiococcus otitidis* that may fall into this class of proteins.

The proteins encoded by *Alloiococcus otitidis* identified ORFs were also evaluated for other useful characteristics. A tandem repeat finder (Benson, 1999) identified ORFs containing repeated DNA sequences such as those found in

MSCRAMMs (Foster and Hook, 1998) and phase variable surface proteins of *Neisseria meningitidis* (Parkhill *et al.*, 2000). Proteins that contain the Arg-Gly-Asp (RGD) attachment motif, together with integrins that serve as their receptor, constitute a major recognition system for cell adhesion. RGD recognition is one mechanism used by microbes to gain entry into eukaryotic tissues (Stockbauer *et al.*, 1999; Isberg and Tran Van Nhieu, 1994). However, not all RGD containing proteins mediate cell attachment. It has been shown that RGD-containing peptides with a proline at the carboxy end (RGDP) are inactive in cell attachment assays (Pierschbacher and Ruoslahti, 1987) and were excluded from consideration. The Geanfammer software was used to cluster proteins into homologous families (Park and Teichmann, 1998). Preliminary analysis of the family classes has provided novel ORFs within a polypeptide candidate cluster, as well as defining potential protein function.

EXAMPLE 6
PROTEOMICS

Two strategies for identifying surface exposed proteins on microorganisms are used to identify surface exposed proteins on *Alloiococcus otitidis*. The first involves digesting of the surface of live organisms with protease and analyzing the released proteins. The second involves the purification of cellular membrane in a way that preserves the interaction of proteins that normally associate with the membrane. Both techniques revolve around the use of mass spectroscopy to identify the proteins that are detected but otherwise differ substantially.

In the first strategy, cells are treated with proteolytic enzymes in isotonic solution without substantial cell lysis. Experimentally, the cells are washed and suspended in an isotonic glycerol solution of neutral pH. A reductant, dithiothreitol, is first added to cleave the protein disulfide linkages and then iodoacetamide is added to alkylate the exposed cysteine thiols. The objective of this step is to break up the secondary and tertiary structure of the surface proteins. Porcine trypsin is then added and the cells are incubated at 37°C for 4 to 24 hours. The cells are then spun down and the supernatant containing the digest of surface exposed proteins is analyzed by mass spectroscopy (vide infra). At the end of the procedure, cell integrity is observed by Scanning Electron Microscopy (SEM). Cells, so treated, have a strikingly different morphology, as seen

under the SEM, which is best described as a "clean shave". That is, the normal spongy or furry appearance is replaced by a smooth spherical morphology. Maintaining cell integrity throughout this operation is important. The intact cell membrane protects all intracellular proteins from the proteolytic step required for identification. Any ruptured cells therefore spill intracellular proteins into the extracellular environment where they are digested and erroneously identified as surface exposed proteins.

In the second strategy, proteins with a natural tropism for membranes are copurified with membranes by simple centrifugation. In principle, this separates proteins into two classes; soluble and membrane bound. In this case, the class of interest is membrane bound because many of these are also surface exposed as well. Experimentally, cells are ruptured in the absence of detergent by sonication or shear and the lysate is subjected to differential centrifugation. The pellet from a high speed spin (20,000 x g) consists of membranes and their associated proteins. This pellet is then dissolved in SDS load buffer and then separated by SDS PAGE. The gel, after staining, shows a large number of still intact proteins that share the quality of being membrane bound. The protein bands from this gel are then cut and exposed to trypsin for the obligate digestion before mass spectroscopic identification.

It should be pointed out that many of these proteins are actually on the inside (cytoplasmic) surface of the membrane and may well have no surface exposure at all. There are several advantages to this method, however, that offset this apparent lack of selectivity. Many proteins are not apprehended by the aforementioned technique of surface digestion are, however, captured by membrane enrichment. Surface digestion fails for proteins that are minimally exposed to the protease. This would be the case for proteins that are highly structured, membrane buried, or heavily glycosylated. In the final analysis both techniques have different merits and shortcomings and can be used in a complementary way.

In a typical example, a membrane preparation was dissolved in SDS load buffer and the proteins separated by SDS PAGE. After staining with colloidal Coomassie Blue stain, fifteen gel bands containing the entire sample lane were excised and the bands digested individually with trypsin. The tryptic peptides were analyzed using microcapillary reversed-phase liquid chromatography – nano-electrospray tandem mass spectrometry (LC-MS/MS) on a Finnigan LCQ Deca quadrupole ion trap mass spectrometer. Acquisition was performed using a "3 CADs experiment". Using SEQUEST software, the

uninterpreted tandem mass spectrometric information was used to search appropriate sequence databases to identify the proteins present in each gel band.

EXAMPLE 7

PROTEIN IDENTIFICATION

In order to identify the polypeptide components in the complex surface digest mixture, an analytical technique is used to separate and sequence multiple peptides with high sensitivity over a large concentration range. Tandem mass spectrometry (MS/MS) has been shown to be a powerful approach to analyze proteins from both gels and in solution. MS/MS first uses a mass analyzer to separate a peptide ion from a mixture of ions, then uses a second step or mass analyzer to activate and dissociate the ion of interest. This process, known as collision induced dissociation (CID) causes the peptide to fragment at the peptide bonds between the amino acids, and therefore, the fragmentation pattern of a peptide can be used to determine its amino acid sequence. In addition, the SEQUEST computer algorithm can be used to search the experimental fragmentation spectrum directly against protein or translated nucleic acid sequence databases. For peptides above roughly 800-900 Da in size, a single spectrum can uniquely identify a protein.

To sequence multiple peptides from a complex mixture, a reversed phase chromatography system is coupled to an electrospray ion trap mass spectrometer. In this system, it is known that high sensitivity (down to sub-femtomole levels) is attained by minimizing both flow rate and column diameter to concentrate the elution volume and direct as much of the column effluent as possible into the orifice of the mass spectrometer detector. Initial experiments separated peptides using a reversed phase gradient of 1% acetonitrile/minute. In order to increase chromatographic separation, longer gradients, down to 0.28% acetonitrile/minute, and slower flow rates (50 nL/min) will be employed. To maximize the coverage of proteins present in the sample, the data-dependent acquisition feature of the ion trap is employed. The instrument is programmed to acquire a single ms scan in the range of m/z 375-600, then to obtain ms/ms data on the top two ions in that range. It then acquires another ms scan in the range of m/z 600-1000, and obtains ms/ms data on the top two ions in that range. This results in better coverage of the larger peptides.

Dynamic exclusion is used to prevent reacquisition of tandem mass spectra of ions once a spectrum had been acquired for a particular *m/z* value. The isotopic exclusion function excludes the ion associated with the ^{13}C isotope of peptides from the list of ions slated for MS/MS. A 3-μ mass width window is selected for this purpose. Using these data-dependent features dramatically increases the number of peptide ions that will be selected for CID analysis.

EXAMPLE 8

SEQUEST ANALYSIS

The LC-MS/MS data acquisition conditions described above typically results in fragmentation data for more than 2000 peptide ions for each run. Using the Sequest algorithm, this data is searched against a composite protein sequence database containing the translated ORFs from *Alloiococcus otitidis* combined with the non-redundant protein sequence database OWL. Sequest search conditions using a modified trypsin selectivity allows a differential search of +16 Da on methionine (to account for met oxidation). Candidate matches identified by Sequest are confirmed using the following manual procedure. Those matches with Xcorr values greater than 2.5 (a measure of the similarity of the experimental ms/ms data to that generated from the sequence database), and delCn values greater than 0.1 (delCn measures the normalized difference between the Xcorr values of the first and second matches), are chosen for further analysis. The fragmentation spectra from good matches are checked for reasonable signal/noise, and the list of matched ions are examined for reasonable continuity. Some matches that are not acceptable alone are only included if other confirmatory ms/ms data is generated by the same sample.

EXAMPLE 9

CLONING AND PROTEIN EXPRESSION

Primer sets are designed for PCR amplification of desired ORFs such that the forward 5' primer anneals at the start of the predicted mature protein. For lipoproteins, the 5' forward primer is designed to anneal just after the codon encoding a cysteine residue of the mature protein to minimize disulfide bridging. Design of the opposing reverse 3' primers independent upon the type of predicted protein. For those proteins

that contain an LPXTG, the primer is designed such that it anneals at the beginning (5' end) of the cell wall anchor region. For all other predicted proteins, primers are redesigned such that they anneal at the 3' end of the ORF. Additionally, the 5'-forward primer is initially designed to allow an in-frame fusion to thioredoxin with the opposing 3'-reverse primer allowing read-through to include a downstream his-patch and V5 epitope (pBAD/thio-TOPO®, Invitrogen, Carlsbad, CA). In parallel, these same PCR products are cloned into pCR®T7TOPO® (Invitrogen, Carlsbad, CA). This allows for an N-terminal fusion to a Xpress epitope and a his-tag for purification.

All PCR reactions are performed using *Alloiococcus otitidis* chromosomal DNA as the template. PCR products are transformed into the *E. coli* host, TOP10, and plated on SOB containing 100 μg/mL ampicillin. Colonies are screened by PCR amplification using a vector specific 5' primer and the specific 3' reverse primer annealing to the gene insert. Colonies are seeded into wells of 96 well microtiter plates containing 50 μ L 50% glycerol. Ten-12 colonies per gene are seeded in one row of the plate. In a second 96 well PCR plate, 50 μ L reactions are set up specific to the gene of interest. One μ L of the cells suspended in glycerol is used as template in the PCR reaction. Reactions that produce bands of the expected size are analyzed further. The cells that are seeded in 50% glycerol have SOB media added to them and incubated at 37° C for 5-8 hours and frozen at –70° C.

PCR positive colonies are inoculated into 2 mL cultures for overnight growth. Part of the culture is used to prepare plasmid DNA that is then analyzed by restriction digestion to confirm the inserts while another part is used to seed 10 mL expression cultures (for pBAD plasmids) for expression. Mid-log phase cultures are induced with 0.5% L-arabinose for 2-3 hours. T7/NT plasmids are transformed into the expression strain BLR(DE3) pLysS before screening. T7/NT cultures are induced by the addition of 1 mM IPTG and incubated for 2 hours. Whole cell lysates of induced cultures are run on SDS-PAGE in duplicate. One gel is stained with Coomassie and the other transferred to nitrocellulose and probed with antibody to the relevant epitope tag.

Positive clones are grown in 1-2 L volumes and induced for large-scale purification. Solubility and expression level of the recombinant proteins are assessed by freeze-thaw lysis of the cells, followed by DNase/RNase digestion and centrifugation at 9,000 x g for 15 minutes in a RC5B refrigerated centrifuge. The soluble fraction is removed from the insoluble material and both are then separated and evaluated for

protein localization and expression by SDS-PAGE. Soluble fusion proteins are purified by passing the soluble fraction of lysed cells over Ni-NTA (Qiagen) resin and eluting the bound proteins with imidazole. Eluted proteins are buffer exchanged on PD-10 columns (Amersham Pharmacia Biotech, Piscataway, NJ).

Insoluble recombinant proteins are washed using centrifugation 3 times in PBS, 0.1% Triton-X100. The inclusion bodies are then solubilized in PBS- 4 M urea and buffer exchanged through a PD-10 column (Amersham Pharmacia) into PBS, 0.01% Triton-X100, 0.5 M NaCl.. Proteins are quantitated by the Lowry assay (Lowry *et al.*, 1951), and checked for purity and concentration by SDS-PAGE.

EXAMPLE 10

GENERATION OF POLYCLONAL ANTISERA AND MONOCLONAL ANTIBODIES

To generate monoclonal antibodies, female, eight week old Blab/c mice are inoculated intraperitoneally with the gene products three times in a four week period (week 0, 2, 4). The dosage of the protein gene product is between 5 and 50 go. Two different fusion procedures are performed. The first fusion is done after a three-month rest period and an intraperitoneal boost with the protein; the second fusion is done after a four-month rest period and a boost by the same route. During the immunization and rest period, mouse sera recollected and tested for antibody activity by ELISA using the protein as the coating antigen.

For both fusions, the spleens are excised from two immunized mice about 72 hours after the last injection and mixed with the nonsecreting X63Ag8.653 mouse (Balb/c) myeloma cells in a 5:1 ratio (splenocytes:myeloma). The cells are allowed to fuse for four minutes in 50% (wt/wt) polyethylene glycol 1500 and 10% dimethyl sulfoxide in Dulbecco's Modified Eagle medium (D-MEM). Multiple dilutions of the fused cells are then made into the selection medium, i.e., D-MEM supplemented with hypoxanthine, aminopterin, thymine, 10% fetal bovine serum, and 10% NCTC-109 medium supplement (Gibco-BRL). The reactivity in each dilution is evaluated by SDS-PAGE western blots, dot blots, and ELISA using the gene product protein and whole bacterial cells as the detection antigens. The positive reacting hybridomas are identified and saved. These hybridomas are then further subcloned by the limiting dilution procedure to isolate the individual antibody secreting cells. The selected hybridoma cells are then used to

prepare the monoclonal antibodies. This is either performed by growing them in D-MEM and concentrating the supernatant by ammonium sulfate precipitation, or by injecting mice with the hybridoma cells and collecting the resulting ascites fluid.

Example 11

ELISA TITRATION OF MOUSE AND HUMAN SERA, MONOCLONAL ANTIBODIES, AND MUCOSAL WASHINGS AGAINST GENE PRODUCTS AND WHOLE BACTERIA

The levels of antibodies elicited by the gene products cloned and expressed as per Example 10 toward themselves and whole bacterial cells are measured by Enzyme linked immunosorbent assay (ELISA). For the whole cell ELISA, the bacteria are grown overnight on agar medium and swabbed into PBS. The turbidity of the cells is adjusted to 0.10 at 600 nm and 100 μl added to the wells of a 96 ELISA plate. The cells are dried overnight at 37°C, sealed with a mylar plate sealer and stored at 4°C until needed. On the day of the assay, the residual protein binding sites are blocked by adding 5% non-fat dry milk in PBS with 0.1% Tween 20 (BLOTTO) and incubating at 37°C for one hour. The blocking solution is then removed and 100 μl of sera serially diluted in the wells with BLOTTO. The sera are allowed to incubate for 1 h at 37°C. The plate wells are soaked with 300 ml PBS containing 0.1% Tween 20 for 30 seconds and washed 3 times for 5 seconds with a SkanWasher 300 plate washer (Skatron Instruments AS, Norway) and then incubated 1 hr at 37°C with goat anti-mouse IgG conjugated to alkaline phosphatase (BioSource International) diluted 1:1000 in BLOTTO. After washing, the plates are developed at room temperature with 100 μl per well of 1 mg/ml p-nitrophenyl phosphate dissolved in diethanolamine buffer. Development is stopped by adding 50 μl of 3N NaOH to each well. The absorbance of each well is read at 405 nm and titers calculated by linear regression. The titer is reported as the inverse of the dilution extrapolated to an absorption value of 0.10 units.

For the antigen specific ELISA's, the proteins are diluted to a concentration of 5 µg/ml in a 50 mM sodium carbonate buffer (pH 9.8) containing 0.02% sodium azide (Sigma Chemical Co.). One hundred micro liters is added to each well of a 96 well E.I.A./R.I.A medium binding ELISA plate (Costar Corp., Cambridge, Ma.) and incubated for 16 hours at 4° C. The plates are washed and subsequently treated the same as described for whole cell ELISA procedure except, in addition to dilutions of sera, mucosal washings and monoclonal antibody suspensions are tested as well.

EXAMPLE 12

IMMUNOGOLD LABELING OF *ALLOIOCOCCUS OTITIDIS* AND low voltage Scanning Electron Microscopy

Surface exposure of proteins on *Alloiococcus otitidis* is assessed by immunogold labeling of whole bacteria and electron microscopy. Bacteria cells are labeled as previously described (Olmsted *et al.*, 1993). Briefly, late-log phase bacterial cultures are washed twice, and resuspended to a concentration of 1 x 10^8 cells/ml in 10 mM phosphate buffered saline (PBS) (pH 7.4) and placed on poly-L-lysine coated glass coverslips. Excess bacteria are gently washed from the coverslips and unlabeled samples are placed into fixative (2.0% glutaraldehyde, in a 0.1 M sodium cacodylate buffer containing 7.5% sucrose) for 30 min. Bacteria to be labeled with colloidal gold are washed with PBS containing 0.5% bovine serum albumin, and the pre-immune or hyper-immune mouse polyclonal antibody prepared above applied for 1 hour at room temperature. Bacteria are then gently washed, and a 1:6 dilution of goat anti-mouse conjugated to 18 nm colloidal gold particles (Jackson ImmunoResearch Laboratories, Inc., West Grove, PA) applied for 10 min at room temperature. Finally, all samples are washed gently with PBS, and placed into the fixative described above. The fixative is washed from samples twice for 10 min in 0.1 M sodium cacodylate buffer, and postfixed for 30 min in 0.1 M sodium cacodylate containing 1% osmium tetroxide. The samples are then washed twice with 0.1 M sodium cacodylate, dehydrated with successive concentrations of ethanol, critical point dried by the CO_2 method of Anderson (Anderson, 1951) using a Samdri-780A (Tousimis, Rockville, MD), and coated with a 1-2 nm discontinuous layer of platinum. *Alloiococcus otitidis* cells are then viewed with a LEO 1550 field emission scanning electron microscope operated at low accelerating voltages (1-4.5 keV) using a secondary electron detector for conventional topographical imaging and a high-resolution Robinson backscatter detector to enhance the visualization of colloidal gold by atomic number contrast.

EXAMPLE 13

INTRANASAL AND PARENTERAL IMMUNIZATION OF MICE

Six-week old, pathogen-free mice are purchased from Jackson Laboratories (Bar Harbor, Maine) and housed in cages under standard temperature, humidity, and lighting conditions. The mice, at 10 animals per group, are immunized with an appropriate amount of the protein(s) to be tested. For parenteral immunization, the protein is mixed with 100 µg of monophosphoryl lipid A (MPL™) (Corixa, Hamilton, MT) per dose to a final volume of 200 µl in saline and then injected subcutaneously (SC) into mice. All groups receive a booster with the same dose and by the same route 3 and 5 weeks after the primary immunization. Control mice are injected with MPL™ alone. All mice are bled two weeks after the last boosting; sera is then isolated and stored at –20°C. For intranasal (IN) immunization, mice receive three IN immunizations one week apart. On each occasion, an appropriate dose of the protein to be tested is formulated with 0.1 µ g of CT-E29H, a genetically modified cholera toxin that is reduced in enzymatic activity and toxicity (Tebbey *et al.*, 2000), and slowly instilled into the nostril of each mouse in a 10 µl volume. Mice immunized with CT-E29H alone are used as controls. Serum samples are collected one week after the last immunization.

EXAMPLE 14

IN VITRO OPSONPHAGOCYTOSIS ANALYSIS

An *in vitro* opsonic reaction, that may mimic the *in vivo* reaction, is achieved when a mixture of *Alloiococcus otitidis* cells, heat inactivated human serum containing specific antibodies to the alloiococcal strain, and an exogenous complement source are incubated together. Opsonophagocytosis proceeds during incubation of freshly isolated human polymorphonuclear cells (PMN's) and the antibody/complement /alloiococcal cell mixture. Bacterial cells that are coated with antibody and complement are killed upon opsonophagocytosis. Colony forming units (cfu) of surviving bacteria that escape from opsonophagocytosis are determined by plating the assay mixture. Titers are reported as the reciprocal of the highest dilution that gives $\geq$ 50% bacterial killing, as determined by comparison to assay controls. Specimens, which demonstrate less than 50% killing at the lowest serum dilution tested (1:8) are reported as having an OPA titer of 4. The

highest dilution tested is 1:2560. Samples with ≥ 50% killing at the highest dilution are repeated, beginning with a higher initial dilution.

The method described herein is a modification of Gray's method (Gray, B.M. 1990). The assay mixture is assembled in a 96-well microtiter tissue culture plate at room temperature. The assay mixture consists of 10 μL of test serum (a series of two-fold dilutions) heated to 56°C for 30 minutes prior to testing, 10 μL of preclostral bovine serum (complement source) having no opsonic activity for the bacterial test strain, and 20 μL of buffer containing viable *Alloiococcus otitidis* organisms. This mixture is incubated at 37°C without CO_2 for 30 minutes with shaking. Next, 40 μL of human PMNs, freshly prepared from heparinized peripheral blood by dextran sedimentation and Percoll density centrifugation, suspended in buffer at a concentration of 1 x 10^6/mL is added. The assay plate(s) is then incubated at 37°C for an additional 90 minutes with vigorous shaking. Aliquots from each well are dispensed onto the upper 1/4 of a 15 x 100 mm blood agar plate. The blood agar plate is tilted while pipetting to allow the liquid suspension to "run" down the plate. Plates are incubated overnight in 5% CO_2 at 37°C. The viable cfu are counted the following morning. Negative control wells, lacking bacterial cells, test serum, complement and/or phagocytes in appropriate combination are included in each assay. A test serum control, which contains test serum plus bacterial cells and heat-inactivated complement, is included for each individual serum. This control is used to assess whether the presence of antibiotics or other serum components are capable of killing the bacterial strain directly (*i.e.* in the absence of complement or PMN's). A human serum with known opsonic titer is used as a positive human serum control. The opsonic antibody titer for each unknown serum is calculated as the reciprocal of the initial dilution of serum giving 50% cfu reduction compared to the control without serum.

EXAMPLE 15

MOUSE NASAL CLEARANCE MODEL

The gene products are evaluated in a mouse nasal clearance model. Groups of at least ten mice, of either the C3H/heJ or Balb/C strains, are immunized as described above. Approximately two weeks after the last immunization, the mice are anesthetized with 1.2 mg of ketamine HCl (Ft. Dodge Laboratories, Ft. Dodge, Iowa) by i.p. injection.

The mice are then challenged intranasally by placing 10 µL of a suspension the 1104-92 isolate of *Alloiococcus otitidis* prepared to an A_{550} of 0.5 in the nose and allowing the animal to inhale it. The 1104-92 isolate used for this challenge is passaged twice in mice by intranasal instillation to select for a variant with optimal colonization capacity. After five hours the mice are killed, their nasal turbinates removed, homogenized in 2 ml of sterile saline, appropriately diluted, and plated onto selective agar medium. The selective medium is a Columbia based agar supplemented with 0.5% Tween-80, 0.5% azide and 20 mg/L erythromycin. Owing to its slow growth, *Alloiococcus otitidis* requires 3 to 4 days before colonies a visible on this medium. The degree of clearance of the immunized mice is calculated as the percent decrease in colony forming units (CFUs) and statistically compared to a set of mice immunized with an unrelated protein such as CRM, Keyhole Limpet Hemocyanin (KLH) or other protein not derived from *Alloiococcus otitidis*.

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U.S. Patent 4,873,191

U.S. Patent 4,873,316

U.S. Patent 4,987,071

U.S. Patent 5,116,742

U.S. Patent 5,168,062

U.S. Patent 5,223,409

U.S. Patent 5,328,470

U.S. Patent 5,580,859

U.S. Patent 5,643,576

U.S. Patent 6,127,170

U.S. Patent 6,113,918

U.S. Patent 6,168,918

U.S. Patent 6,168,943

U.S. Patent 6,207,646

International Application No. EP 125,023

International Application No. EP 171,496

International Application No. EP 184,187

International Application No. EP 264,166

International Application No. EP 524,800

International Application No. EP PCT/US86/02269

International Application No. WO 00/18434

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